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Wyman-Gordon Energy-Saving Campaign Aids Community and Company

The saving of gas, oil and electricity in W-G's energy reduction campaign would supply the needs of some 1,500 to 2,000 homes. And our campaign continues to grow.

As energy shortages deepen, conservation by each user helps ease the crunch for everyone. W-G's effort not only increases company efficiency but can be important to the Worcester area.

Our energy campaign has another benefit also; by rigorous control of all costs — energy is one of W-G's significant costs — we strengthen our competitive ability to maintain sales, production and employment. In these times of business slowdown the community needs all its industries operating as fully as possible.

Metal processing requires a lot of gas, oil and electricity; we're one of the largest users in New England. Our operations have increased and we've been installing improved pollution control equipment which takes additional power. But at the same time we've reduced our energy use some 15%, and are still making progress.

Government Agencies Issue Warnings

The Federal Energy Administration and other agencies, both government and private, are giving plenty of warning on the ways we'll all be affected by the world energy situation. No matter who is to "blame" or how many interpretations come at us from politically motivated sources the problem is real, and we have to learn to live with its implications as they confront us day to day.

At W-G the FEA tells us we can't increase oil usage over last year unless: 1) we can unequivocally *prove* our need; and 2) we have a well-established and effective conservation program. The gas company tells us there's a real possibility of cutback in gas supply to W-G. This area is at the farthest end of the pipelines from the gas fields; weather and supply problems almost anywhere in the country can affect the supply here. Electric power supply seems OK for this year, but since much of our power is generated from high-priced imported oil the supply picture could change, and certainly prices will continue high.

Therefore, to keep up production, provide service to customers and maintain employment, our conservation campaign absolutely must continue as a top priority effort for all.

Twin Energy Problems are Here to Stay

The twin troubles of escalating cost and limited supply will be with us for a long, long time.

They affect industry just as they affect homes. They mean changing accustomed ways of doing things, increased inconvenience and discomfort, attention to details we used to overlook, continual search for new ways to economize, significantly altering our living habits. These are now a permanent part of our industrial and personal way of life.

This isn't news, although some people still try to pretend it's unreal or will disappear if they look the other way. What we think *is* news is the fact that it doesn't have to be all gloom, frustration and impossible. Our people have made great strides in meeting the facts head on, have taken on some inconvenience and many changes, and are steadily working to accomplish more.

Ways W-G Saves Gas, Oil and Electricity

Many steps have been taken and others are on the way. Some of them are:

1. We removed electric lights and bulbs where not indispensable for acceptable minimum-level lighting for work. The total taken out was over 1,000,000 watts. This is the equivalent of 20,000 50-watt bulbs. . . or 500,000 electric clocks, or 7,000,000 night lights!

2. Lights and motors are turned off when not in immediate use. This seems an obvious idea, but it's not easy to accomplish; it takes added thought and attention by many people to make it work. Under the new facts of cost and limited supply it's worth the effort.

3. Thermostats are set lower, and windows and ventilators are more carefully controlled. Again requiring attention and cooperation of many people.

4. New expansion joints were installed in steam heating lines. This provides increased flexibility of heating control in the plant without undue stresses in the steam piping system.

5. New gas furnaces are designed with "recuperators" which use hot exhaust gases to preheat incoming combustion air going to the furnace burners. They can reduce gas consumption some 15%. However, they're expensive and previously couldn't be justified on a cost-payback basis. But now they are justified by the new facts of decreased supply and increased prices.

6. Improved insulation is being maintained on certain structural members in Grafton gas furnaces. This change by itself will eventually save enough gas to supply several hundred gas-heated homes.

7. We are experimenting with changing furnace linings from firebrick to fiber blanket. This permits faster heating and cooling without cracking the lining and also takes less gas in startup to get the furnace to operating temperature. The total saving can be as much as 15%. However, the fiber lining is more costly to install and is easier to damage when loading or unloading the furnace. Its initial use will probably be in car-bottom units which are loaded outside the heated sections of the furnace.

These are some of the steps we've taken. Ideas come from everywhere and everyone. The Committee acts as collector and coordinator as well as initiator.

W-G Initiated Program Almost Two Years Ago

Our Energy Committee was formed in early 1973 to focus attention on stringent control of gas, oil and electricity, the Big Three energies vital to our operation. This was months before the energy crisis was generally recognized, and our Committee was one of the first of its kind anywhere in the country.

The Committee includes: T. R. Carlin, Purchasing; J. J. Conneally, Production; R. J. Donley, Energy Engineer; G. L. Durfee, Facilities Engineering; R. F. Goodspeed, Plant Engineering; Michael Hopper, Data Processing; J. P. Molony, Quality Assurance; J. M. Mullaly, Accounting and L. P. Pouliot, Plant Engineering. Ray Donley, an experienced W-G engineer, was assigned full time to the effort.

Supply shortages and price increases were expected and we hoped for some relief through the work of the new Committee. But we certainly didn't anticipate how drastic the shortages or how astronomical the prices would be; nor did we realize how truly significant the conservation campaign could be.

Thanks To Our People It's Working

Energy saving in industry, just as at home, requires the interest, cooperative understanding and attention to detail of everyone. No individual or committee can do the job alone.

We're proud and appreciative of the support all our people have given this campaign. The record proves it; such accomplishment is impossible without it.

If you have any suggestions or would like to discuss any part of our energy campaign we will appreciate hearing from you. Please get in touch with our Committee chairman, Tom Carlin. You can phone him at 839-4441 or write to him,

Wyman-Gordon Company
Worcester, Mass. 01601.

WPI journal

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The cover: A liverwurst by any other name . . . Photograph by the editor

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by the editor

Do you suppose there's a group rate for recruiting students?

It was the day after Christmas and Roy Seaberg, '56, was minding the store in the admissions office. The telephone rang, with the question of whether WPI could house and help teach English to a group of Venezuelan students, sponsored by their government, who would then be regular undergraduates.

On January 23, twenty men and one woman arrived from Caracas via New York. Some of the students had seen their first city, Caracas, just the week before. None of them could speak much if any English. And they were not prepared for New England in the wintertime.

During the four weeks between phone call and arrival, a whole program for winter and spring terms was organized. Prof. Donald Johnson, head of the Humanities Department, arranged for Holy Cross professor Charles Tatum and WPI lecturer Kay Draper to teach the Venezuelans English, using Holy Cross's language laboratory and student tutors. English studies will take up about two-thirds of the group's first terms at WPI. The remaining third will be a special section of Math 1010, differential calculus, taught by Dean of Academic Advising John van Alstyne and a Peruvian graduate assistant. Civil Engineering professor Allen Benjamin, who has worked in South America and speaks fluent Spanish, will be helping advise the students.

But now it's late January and the Venezuelans have just arrived. The immediate problems fell to Student Affiars dean Bernard Brown, who is foreign student advisor. Hard at work over the week's end, he got them settled into their fraternity house rooms, took them shopping for coats, boots, gloves, and other necessities, and generally had the job of getting them oriented to the college and the community.

After their arrival, a number of the Venezuelans wanted to send messages home, so Dean Brown made arrangements for the sending of telegrams. A half-dozen or so wanted to telephone, and when they did an interesting fact emerged: a three-minute phone call to Venezuela can be cheaper than a telegram. Within half an hour the telephone calls were all finished. *(Editor's note: sometimes I can't get half a dozen telephone connections through to the other side of Worcester in that length of time!)*

Although it is a little early for anthing but first impressions on either side, the Venezuelans seem very determined to learn English and to mix in with the rest of the students body. Because of the suddenness of the program, they are housed where there was space available, which meant the fraternity houses. Twelve, for example, are living at Theta Chi. This has upset a couple of the students, who strongly resist being segregated off into a special corner of the campus. This same feeling emerged when Dean Brown arranged for them to see a Spanish-language film their first weekend here, simply as entertainment. They expressed concern that they were being isolated from American culture; they wanted to be integrated into the campus as soon as possible.

The Venezuelan government calls this undertaking the Programa Gran Mariscal de Ayacucho. It was inaugurated last fall, coinciding with the 150th anniversary of the victory which consolidated the political independence of South America. The aim of the program is to both build and broaden the base of educated people who will provide Venezuela's social and economic leadership in the future. Traditionally in Venezuela, the elementary and secondary education available in rural areas has lagged behind that of the urban centers. Therefore, 60 percent of the scholarship funds are earmarked for students who live outside Caracas, the capital city. The students have their tuition, room, and board paid by the government, as well as a monthly stipend. It is expected that the students at WPI will spend five years, including summers, to achieve English fluency and receive their bachelor's degrees.

At present, there are some 1,400 Venezuelan students in the United States under the Programa Gran Mariscal de Ayacucho. About 1,000 entered last summer, and the remainder in January.

What purpose the *Journal*?

Editor: I am pleased to see WPI publications win critical acclaim. The recent editions of the JOURNAL which are devoted to energy (and past articles written in a similar vein) are of a high caliber and scholarly quality. They are sure to maintain our high esteem in the realm of college journalism.

However, I suspect that most alumni would prefer a campus news magazine to a technical journal. Perhaps an article (authored by a member of the Tech community) about WPI's energy-related programs might be more appropriate. Perhaps even an analysis as to how the energy crisis is affecting the thrust of the environmental project work.

More pointedly, is the main purpose of the JOURNAL to elicit greater alumni-student-faculty interaction? Or is the JOURNAL to serve primarily as an organ of continuing education? Tech alumni can turn to any of a number of publications to keep abreast of the energy crisis. But where, other than to the JOURNAL, can they turn for news of the Hill?

John Zorabedian, Jr., '72

Editor: After rereading the latest issue of the WPI JOURNAL, I felt compelled to write you a brief congratulatory note. I firmly believe that the quality of this year's issues has been the highest that I have ever seen in our alumni magazine. The graphics have been superb; the articles much more selective and highly interesting; the campus notes most informative; and the alumni news more complete than ever.

It is most heartening to see that the criticisms which were made by last year's Committee of Concerned Seniors have been taken as constructively as they were intended. Both you and Ruth Trask were most professional about the entire situation, and I would like to take this opportunity to commend the JOURNAL staff.

Leonard J. Brzozowski, '74
Hanover, N.H.

The energy issue

Editor: My compliments on the latest issue of the JOURNAL.

I found the focus on a major topic (nuclear energy) to be extremely interesting and the type of format I would value highly in the future. Thank you for your efforts.

J. Michael Anderson, '64
New York, N.Y.

Editor: I am writing to ask permission to reprint the article by Edward Teller entitled "Don't sleep with two women in your bed" which was published in your August 1974 issue.

We would like to include it in the forthcoming issue of *Skeptic*, which will be devoted entirely to the problem of energy. Each issue of *Skeptic* is, in effect, a debate-in-print about a matter of current public concern (see the issue on crime which I've enclosed).

Christiane Schlumberger
Forum for Contemporary History
Santa Barbara, Calif.

Editor: In response to your October 1974 issue of "Nuclear energy – the promise and the problems," I should like to comment as one whose professional career has been concerned with the power option.

The coverage given by the contributors was meaningful, but your introductory comments were "right on." Twenty-five thousand words, or even twenty-five million words, can't hack all the complexities. On just one facet of the problem, the AEC public hearings on emergency core cooling systems (ECCS) ran well over fifty million words.

One of the most vocal participants at these hearings was Myron Cherry, whose article you have published and whose career is founded upon an extraordinary ability to use words. See how well he gets his points across as he characterizes nuclear fission plants as "unreliable, dangerous and unethical" in the same light as "slick ad campaigns that tell us to brush, wash, cook and make love electrically." The man is absolutely beautiful in his unabashed use of outrageous innuendo, half-truth, sarcasm, slander – even winding up his article with a jail threat for those responsible "for the mess we're in" – as if he himself had nothing to do with the unfair obstructionist tactics which have cost this country millions of dollars in oil imports as nuclear plants he and his ilk opposed had to stand by idly.

In a debate or contest with the highly articulate opponents of nuclear power, the engineers have come off very poorly indeed. There are many reasons for this, including:

(1) A disturbing "consumerist" public attitude which distrusts any leadership in business, labor or politics . . . applauding the critics of any "big business" . . . especially the utilities. It takes dedicated leadership to accomplish a major nuclear project in the face of the regulatory maze and wavering public acceptance.

(2) A great advantage for those on the attack in a complex technical subject such as nuclear power. Who can boil down in defense the fifty million words on ECCS for adequate public understanding, for example? It has been said that a fool can ask in a day more questions than a wise man could answer in a lifetime. To make matters worse, the nuclear oppositionists are no fools! It is easy to create the impression that engineers don't know what they are doing by merely asking more questions than can be readily answered.

(3) To attempt to settle technical issues by public debate is idiotic. The articulate and inflammatory attacks are exciting but destructive. The dull truths about redundant engineered safeguards do not counter the emotionalist's arguments.

(4) Most engineering schools do not emphasize enough the need for basic communications skills. The engineer, to be "responsible," must be responsive to the public's need to know the essential facts in these technical issues. In communicating with the public, many engineers appear to be "talking down" to the audience – a grievous error.

The dull truth is that the nuclear power option is, for New England, just about the only feasible option we have left for the near term (next thirty years) for meeting base load needs with reasonable environmental compatibility and avoiding dependence upon foreign oil imports.

Coal imported to New England will give us fits trying to meet environmental objectives. (The "outrageous" American Electric Power ads debunking SO_2 scrubber technology claims by EPA come closer to the truth than the dreamers at EPA would have us believe.)

Long-term solutions, such as breeder reactors, fusion, or solar power must receive far greater support than received to date. We must cease using up our precious fossil resources, which as any chemical or plastics engineer will tell you deserve a far better fate than flaming away as a boiler fuel.

R. A. Evans, '38
West Hartford, Conn.

WPI from another perspective

Editor: Congratulations are in order once more for WPI's ingenuity. Not only is the article in *Business Week,* "Engineers Learn by Doing" (August 31, 1974), a great achievement and an invaluable asset to the publication of WPI's revolutionary offerings, but the Alumni Association's idea to send reprints to graduates who may not see *Business Week* is extremely astute. I remember hearing and seeing much short-sighted criticism of the Plan with the not-too-sound reasoning that it would create affected education, a gimmick that would ultimately attract only the laziest and most misdirected of students to WPI. The results of the first projects – indeed merely the scope and relevance of these projects – should make obvious the point that the planners had in mind an approach that would realistically educate persons in skilled, applicable engineering. Now a national weekly magazine has seen fit to make this innovation more generally known.

I have been engaged in graduate study at another well known engineering school, Purdue University. Although I did not graduate from WPI as an engineer – I was honestly disillusioned with the profession, not with the school – I think I can view other engineering students with a critical eye. The traditional program of study offered to undergraduates here has very little room for nontechnical academic study. Perhaps the Big Ten consciousness assumes that extracurricular energies spent in varsity athletics should produce the most well-rounded and able engineers; I'm not sure. But it seems it is Purdue's aim to leave any *Active* engineering – that is, project work – for its "more qualified" graduate students. The percentage of BS holders who go directly from this university to jobs, however, is still quite high. Hence the general undergraduate complaint is, understandably, that school is rather meaningless, that what one needs to know about practical engineering will come after one is hired, in on-the-job training.

I am ecstatic that WPI is engaged in something different. There you *are* making school meaningful; there you *are* building a foundation that will help bridge the fathomless "relevancy gap" so common to contemporary education; there you *are* sending engineers rather than trainees to occupational positions.

The Bachelor of Science degree from WPI is a document that truly reflects knowledge gained in an educational experience. If the criticism of the Plan has not turned the heads of the men and women in the Ford Foundation, the National Science Foundation, the Sloan Foundation, or the National Endowment for the Humanities, then it certainly should not turn the heads of prospective students eager to *work* in the field they desire to make their career. The WPI PLAN does not attract lazy students; on the contrary, it is a much more rigorous program of study than the traditional one. When evaluations are perfected, no student will be able to "sneak through" his or her project work without first having taken a wide variety of preparational courses. And of course, these include ones that will develop student sensitivity to the human implications of designing things for "the betterment of humankind," something that we all know has been too much overlooked in the past.

WPI may be forming the basis of a renaissance man of the 1970's. Criticism is understandable, since it springs mainly from those who have been selectively conditioned to respond to the oversimplified patterns set by narrow, sterile, and compartmentalized education. The WPI PLAN will last as long as society needs work done on it, and God knows, that will be many, many years.

Robert A. Manes, '73
West Lafayette, Indiana

Editor's note: *Mr. Manes was the author of "Seven weeks at the jail," which appeared in the February 1973 issue of the* JOURNAL.

Q: What does a liverwurst have in common with a blood vessel?

A: More than you might think, especially to an enterprising student and an imaginative hospital.

THE DELIVERY MEN thought the request was crazy, and the St. Vincent Hospital Research Foundation asked plenty of questions about the bill. But in the end the WPI students at the hospital received their thirty liverwurst sausages and St. Vincent paid for every one of them. *Thirty liverwursts? Thirty?!*

"We had to have those sausages," says Bill Penney, '73, who looks perfectly healthy and hardly in need of such a bizarre diet supplement. "They were a necessary part of our research."

These days St. Vincent Hospital and the National Science Foundation are supporting a wide range of research and development being conducted under the Internship Center program established just three years ago between St. Vincent Hospital (SVH) and WPI. So far, some 70 students, freshmen to graduate, from all areas of engineering and science, have been involved.

St. Vincent is a 600-bed community hospital committed to medical education. Its postgraduate educational programs involve 81 residents taught by approximately 40 full-time hospital staff physicians, and it maintains an active affiliation with the University of Massachusetts Medical School.

Four years ago, the hospital established a department of biomedical engineering, which now employs two full-time engineers and three technicians. Six additional biomedical engineers are employed in other hospital departments and laboratories (cardiac catheterization laboratory, noninvasive cardiology, clinical pharmacology, respiratory diseases, and vascular research). Clinical and basic research is conducted in several hospital departments and in specialized laboratories, including an animal research facility.

"With such a wide range of facilities, the students can carry on a number of projects," says Albert Shahnarian, '69, a graduate teaching assistant and assistant WPI director of the Internship Center. Those interested in finding out about project possibilities at SVH are invited to attend on-going student project group meetings or exploratory meetings if there is interest in developing a new project area. Each project team is fully supervised. Undergraduates are not paid for their project work, but pay tuition for the experience as they would pay for any other part of their education —this requirement applies for all undergraduate project work on and off campus.

Dr. Walter G. Driscoll, director of facilities development and biomedical engineering at St. Vincent and SVH director of the Internship Center, makes one point clear, however. He says, "When we signed the internship agreement with WPI, we were not looking for extra hands. The students are not working in daily patient care but are assisting us with medical research and development. At all times the student projects are performed under the direct supervision of a physician and faculty advisors."

At WPI, a student normally takes three activities (courses and project work) in each seven-week term. Project objectives are defined for this period of time. This helps students to limit the scope of their project activity to attainable goals and gives them a sense of accomplishment at the end of the seven-week term. Most projects extend for periods of 21 or 28 weeks, with students spending the first seven-week term preparing a project proposal and the final two or three terms finishing the work and writing a report.

"It is essential that we match a student with his or her interests and particular abilities to those of a given hospital project," says John R. Boyd, '70, a biomedical engineer and assistant SVH director of the Internship Center. Once a proper match is achieved, the student team prepares a project proposal detailing the objectives of the investigation, the methods, materials and equipment necessary, a critical path analysis and a statement of the final anticipated result. This proposal is then jointly approved, based upon its educational merits and its value to the hospital departments. During the past three years the development of common research goals among WPI faculty, students, and SVH physicians has become evident.

"Our association with SVH has given our biomedical engineering students the proper clinical environment in which to work," explains Prof. Robert A. Peura, '64, who serves as director of the center. "Law clerks and medical interns have traditionally benefited from practical training under the supervision of a senior member of the profession prior to assuming full job responsibility. Now, at St. Vincent, biomedical engineering students have that same opportunity.

"The greatest benefit has undoubtedly been the educational stimulus to the students," says Dr. Peura. By involving students in the solution of real medical problems, the program motivates students to master an area of engineering or science because they have an immediate, specific use for it, and they experience the satisfaction of using this knowledge to help solve a problem relevant to human needs.

"There is an added incentive for those of us from WPI to make this project work, because it is a perfect example of a project relating technology to the needs of society."

BILL PENNEY (who requested the sausages) was so stimulated by his undergraduate research that he is now a graduate student in biomedical engineering. He has been working with Dr. H. Brownell Wheeler, chief of surgery at St. Vincent, in the development of a device measuring electrical impedance to detect blood clots in major veins. "It is the type of device that could have been used in the diagnosis of Richard Nixon's recent illness," reports Penney. "The potential looks promising. So far the device has had over 95 percent success in detecting serious blood clots."

In order to obtain experimental data on the relationship between change in fluid volume and in impedance variation, he designed experiments which used a sausage as a close approximation to the human leg, in both dimensions and electrical impedance.

"It was at Dr. Wheeler's suggestion that I decided to use sausages," Penney says, "but I didn't know what kind. I couldn't ask my parents' advice, because they're vegetarians. My grandmother isn't, though, and she told me to use liverwurst."

After getting the liverwursts, Penney bored holes in them to simulate blood vessels. The holey sausages were then filled with saline solutions ("we tried using blood; it worked but it was terrible!") while changes in impedance were monitored. Results correlated quite well with Penney's theoretical analyses.

After being initially exposed to vascular research as a senior in electrical engineering, Penney started a basic investigation into the source of the signal measured by the impedance plethysmograph (a device which measures changes in volume). He concluded after researching the literature that many clinical researchers had accepted early work in the field without critical review.

He decided to establish an electrical field model of the human calf, developing competence in electrical field theory by working with WPI physics professor Lorenzo Narducci. Later he developed sophisticated and effective experimental techniques in order to validate his model.

Weekly group meetings impressed upon him the need for well-written project proposals and progress reports. He formulated a critical approach through responsible questioning of project proposals presented at the weekly meetings. Because his theoretical predictions and experimental results agreed reasonable well, he proved to himself that he could successfully apply engineering techniques to the solution of clinical problems.

His interest in his work was aroused and he decided to continue as a biomedical engineering graduate student. Penney's work has been accepted for presentation and publication at a biomedical engineering meeting and he is co-author of an article currently in the medical literature.

It appears that his work at the Internship Center has not only been educationally worthwhile, but has also resulted in tangible scientific accomplishments which have motivated him to pursue further graduate study and will broaden his career opportunities. In addition to furthering his technical knowledge, Penney has developed leadership skills and assumed the role of project manager. He initiated a National Science Foundation (NSF) Student Originated Studies Grant and successfully directed nine students last summer in the vascular research laboratory. The NSF study, involving students from Holy Cross, Clark, and WPI, investigated the feasibility of detecting disorders of arterial flow in the leg by means of impedance plethysmography.

"It was at Dr. Wheeler's suggestion that I decided to use sausages, but I didn't know what kind. I couldn't ask my parents, because they're vegetarians. My grandmother, though, told me to use liverwurst."

GRADUATE STUDENT FREDERICK A. ANDERSON, JR., has been involved in a related project, the calibration of the volume/impedance apparatus for measurements of blood flow in veins. Simultaneous volume measurements employing mechanical and electrical devices were performed on the calves of nine subjects. Analysis showed a linear relationship between venous blood volume and electrical impedance.

Other students are finding the internship program rewarding. For example, Albert E. Barrett and Robert A. Duris, both seniors last year developed a telemetry system for remote monitoring of the human respiratory rate. They created and refined a prototype system in which a pair of eyeglasses worn by the patient broadcasts his respiratory signals to an FM radio.

This project was based on the principle that the difference in temperature between the inhaled and exhaled air of a person is sufficient to cause a significant resistance change in a small thermistor. According to Barrett, the device was designed to measure the number of breaths per minute of a respiratory patient who is ambulatory. "If the patient should suddenly stop breathing, an alarm would immediatley be sent out to the nurse on duty at a central monitoring board," he explains. By utilizing such a respiratory monitoring system, an ambulatory

patient would have much more freedom to move about. He wouldn't have to be confined to his bed by wires. The eyeglass monitor may also be used as a testing aid for the hospital's respiratory laboratory.

Barrett, who has been working for six months, writes: "The experience I gained working on the respiratory monitoring project has helped me out in my job as an engineer at Pratt and Whitney Aircraft more than any single course I took."

Dr. Howard Schwartz, director of emergency medicine at SVH, WPI's Dr. Romeo Moruzzi, Dr. Peura, and Mr. Shahnarian are supervising a group of eight students who are currently looking at the whole question of the emergency medical system for all of Worcester County. "This involves real teamwork on the part of everyone involved," says Peura: "the students, physicians, advisors, and the patients themselves. Also," he adds, "there is an added incentive for those of us from WPI to make this particular project work, because it is a perfect example of a project which relates technology to the needs of society."

They created and refined a system in which a pair of eyeglasses worn by a patient broadcasts his respiratory signals to an FM radio.

Presently several students are working with the department of emergency medicine to investigate specific aspects of the emergency medicine outpatient system in order to build a data base to model the complex interactions of the system. Part of this group is analyzing the operations of the emergency room through the eyes of the patient. A second group is preparing a procedure for collecting accident data with respect to location, ambulance, time, type of emergency, and so forth. The legal and ethical aspects of emergency care are being studied by a third group. The fourth group is looking at the socioeconomic level of patients using the SVH emergency department.

In most cases the information that the students are seeking is largely nonexistent, yet it is necessary in order to begin to understand the complexities of the system. As the current student groups complete their project objectives, it is expected that new students will continue to develop the emergency medical system model for the county.

"Actually," Dr. Peura reports, "the emergency medical system project grew out of an earlier project working with Dr. Steven Ayres, chief of medicine, concerning the implementation of a community coronary ambulance system. This shows how student interest grows and new ideas for viable projects are born."

Some other recent WPI-SVH projects are biotelemetry, using a hospital carrier-current system, design of an arterial-venous shunt, and the programmed move of clinical laboratories into the new Rose Building so as to cause minimum disruption of service.

Current projects include hospital training through videotape, membrane properties of irreversible and reversible sickle cells in sickle-cell anemia, and photomicroscopy.

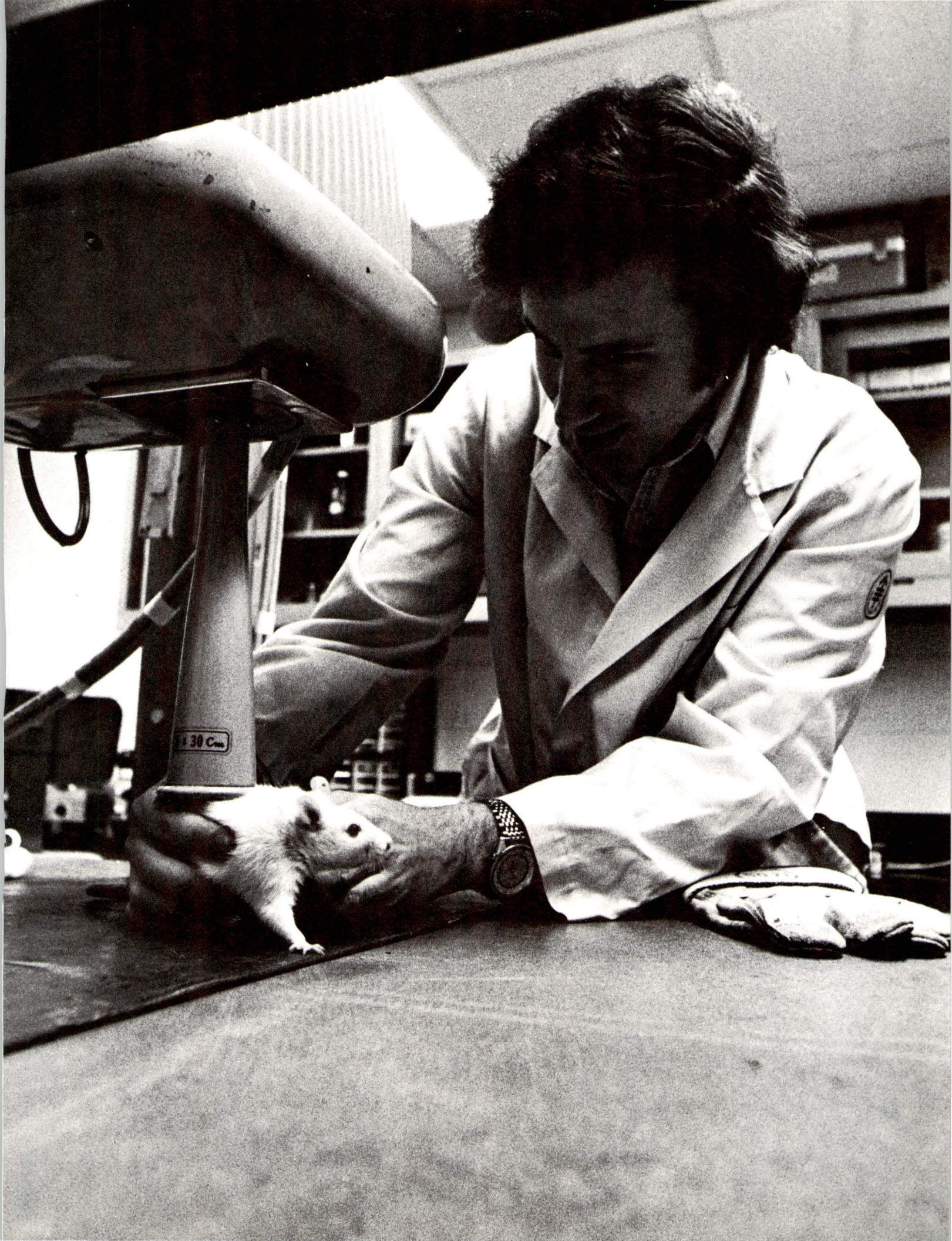
"As you can see," Dr. Peura points out, "a wide range of projects is available. But nothing remains stable. New ideas come along all the time." For example, a vascular research data base is being developed by William D. Cunningham, '77, because there was a need to analyze statistically the patient data record at St. Vincent's vascular research laboratories. The object of this project is to develop a data base and Fortran programs so that the information processing and handling will be more efficient.

Two graduate students have promising projects underway. Bruce Haffty is investigating the possibility of developing a noninvasive technique for the early detection of pulmonary edema. Charles Pritchard, '73, is working on the development of automated computer analysis of electrocardiograms.

Margaret St. John, '75, has been using two electron microscopes for her project, the observation of colon cells. She prepared colon biopsies for WPI's scanning electron microscope, observed and photographed them, and then sectioned them for a look via SVH's transmission microscope. Dr. Jerome Jacobs of the Pathology Department says, "This allows observation of the same cell structure by two methods, one in which the cell surface is observed, and the second where the internal fine structure can be seen."

Robert L. Fried, '75, a physics student, is studying the effects of silicone implants in rats who are exposed to x-rays. This has significant medical application in the management of breast cancer because x-ray therapy is complicated in patients who have existing silicone breast prostheses. Chronic irradiation of these patients imposes risks. Fried is working with two groups of rats, a control plus a second group with silicone implants, which are irradiated five days a week with a controlled dose of x-rays. The rats' temperatures are recorded daily to detect any induced fever.

At right, Bob Fried prepares to anesthetize one of his experimental silicone-implanted rats prior to irradiation.



The test the students helped devise is now a standard clinical lab procedure available to any patient at St. Vincent Hospital.

Oliver J. Smith, '75, recently assisted with the development of a respiratory sound recording system he calls the listening post. A portable electronic system was designed and built to provide a dual-channel signal for magnetic tape recording, with playback at a later time for clinical use.

DURING THE PAST THREE YEARS, the time and facilities invested in the internship program have produced a good return to SVH in terms of useful and practical work; the technical base of the hospital has been broadened significantly. For example, the students in the vascular research laboratory were greatly motivated by the opportunity to work on a problem clearly related to patient needs. They validated concepts behind the measurement of venous outflow obstruction in order to detect the presence of clots. The test they helped devise has now been adopted by the hospital as a standard fee-for-service clinical laboratory procedure available to any patient at St. Vincent Hospital. SVH has also benefited in other ways. Major equipment at WPI has become available for medical use, such as the scanning electron microscope and the computer facilities.

"The research projects have been of value to the WPI faculty advisors, too," relates Shahnarian. "The advisors, through the projects, have been exposed to new applications of engineering and science in medical fields." An exchange of ideas occurs repeatedly between the engineering and medical professions in the joint projects. There have been occasions when the advisors had to study as hard and learn as much as the students.

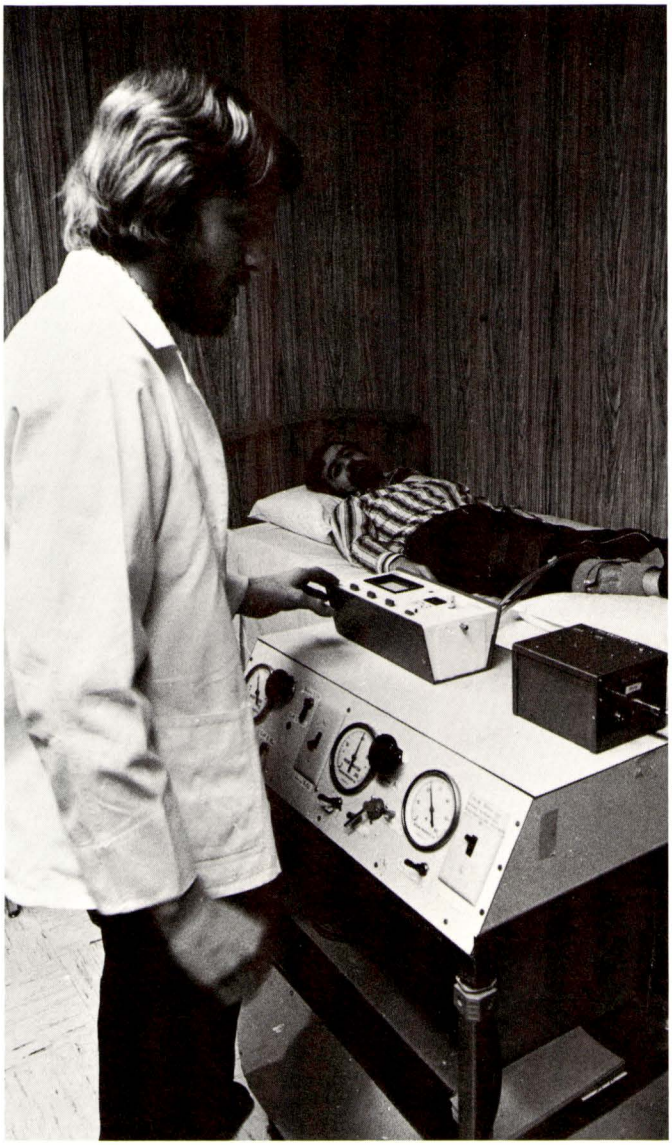
In general, the directors and advisors feel that the students have benefited most of all from the WPI-SVH Internship Center. The program has broadened them educationally by giving them the experience of relating their technical knowledge to actual problems of clinical medicine. They have, for the most part, accepted the challenge willingly and responded with ingenuity and enthusiasm.

Observers of the program believe that it helps students develop foresightedness, sophistication, self-confidence, analytical competence, creative imagination, perseverance, and managerial skills. These attitudes and skills are difficult, if not impossible, to impart in the context of a traditional classroom course.

Projects have helped students to direct their orientation toward further education at both the undergraduate and graduate levels. Many students without any apparent career direction have formalized specific plans for additional education in biomedical engineering or employment in the health-care field.

The WPI-SVH Internship Center has also proved useful for students entering other disciplines. It gives students an opportunity to apply themselves in a complex environment where the challenges are more than technical in nature. They learn to work with and through others, to accomplish specific objectives – a prime prerequisite for success in any discipline, any vocation.

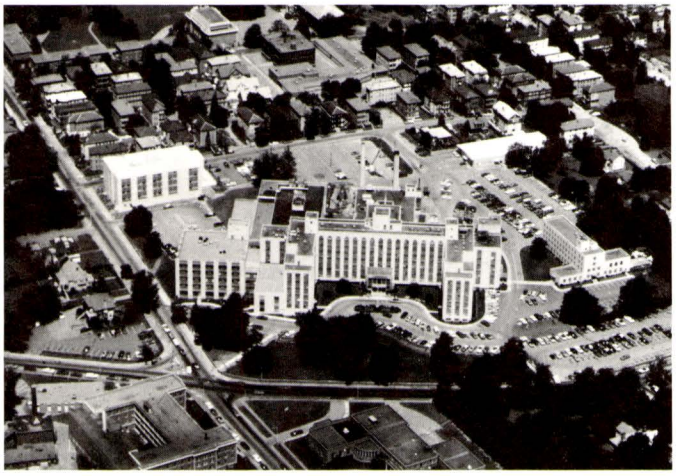
Bill Penney, one of the first students to undertake research at the center, feels that for him learning to communicate was the most rewarding aspect of the program. "There is a constant interplay of technical and medical ways of thinking at the center," he relates. "Everybody is working toward the same goal from a different viewpoint on each project. It's really interesting." WPI



Immediately below is a view of St. Vincent Hospital.

At left below, Paul Schrader sets up instrumentation for a vascular experiment.

At left, Bill Penney uses his blood volume device on a live subject instead of a sausage.



"There was a young lady from Becker..."

ONE OCTOBER AFTERNOON the Goat's Head Pub resembled, at least a little, a poetry festival. The occasion was a limerick contest, with free beer offered as an inducement for students and faculty to participate.

Well, you know how it is with limericks. We both know that I can't possibly print in this magazine the best ones. There does seem to be something inherent in the tradition of limerick writing that ensures that at least 50 percent of all limericks are dirty. And there were several real gems produced in the pub that day which will go unpublished here.

The selection of "verse" that follows omits several prize winners: the "sickest," the "most pessimistic," and an honorable mention for "worst spelled" – one which also didn't seem to make any sense. Because of the free beer offer, a surprising number of limerick writers copped out by ending on one variation or another of "So now let's have my free beer." These were deemed unworthy of perpetuation.

There once was a coed of Worcester
Who dreamt that a Techie sedorcester.
She awoke with a scream,
But 'twas only a dream;
A bump in the mattress had gorcester.

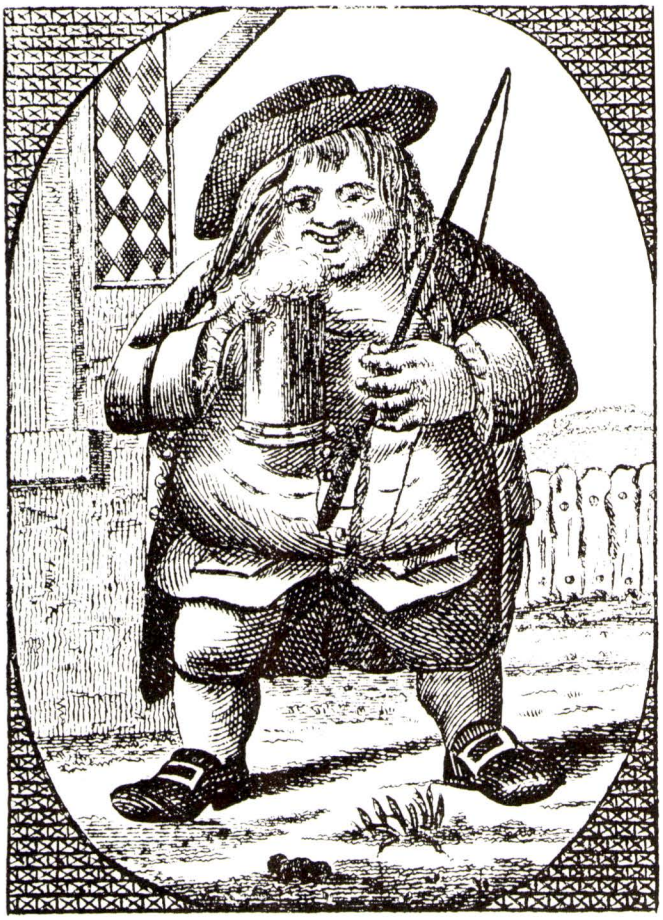
We all know a guy named van-A
Who invented a special new way
The grades are all missin'
With open admission:
If you flunk out you still have to pay.

("funniest")

There once was a school with a Plan
For building the Renaissance Man.
But the Plan didn't work,
So the school built a jerk,
Then took his tuition and ran.

("most optimistic")

There once was a thing called the Plan
Which required a certain elan
But the students and staff
Didn't have it by half
And what is left is incredibly bland.



There was a Recondo named Knute
Who loved above all things to shoot.
When closing in for the kill
Of a frosh on the hill,
Knute misfired and blew up the Tute.

In an effort to be innovative
Tech tries to make us creative.
They first gave us Broc
And to finish their schlock
Use limericks to be humilitative.

A number of students took on faculty members in their versification:

Wilbur Bridgman's been here for a while.
At teaching chemistry he has style;
With his eyes on the floor
And mine on the door
He should be an expert on tile.

There is a professor named Lance
Which conveniently rhymes well with "pants"
But since he's the judge
I'll just say "Oh fudge!"
But after more beer I might take the chance.

There is a professor named Ollie
Who walks around campus quite slowly.
But whenever he's here
He'll be drinking a beer
And smoking cigars that smell moldy.

and finally:

A lazy young Techie named Funt
Most always decided to punt.
While writing this rhyme
He ran out of time

But let's not let it end there. How about some alumni contributions: for each limerick published, the JOURNAL will award one (1) free beer at the pub on the occasion of your next visit to campus. Entries should be related to WPI, and though I promise to enjoy all funny dirty limericks I probably won't print them. Criteria, obviously, are good taste and good humor, the deadline for entries is April 15. You may use the enclosed card for this if you wish.

– R.K.

Dick Whitcomb: NASA's aerodynamic genius does it again.

LAST DECEMBER 13TH was Friday the 13th for everybody else, but for Dr. Richard T. Whitcomb, '43, it was just another lucky day. Another day, another award.

On that particular date, Dr. Whitcomb was presented with the Wright Brothers Memorial Trophy for 1974 at a special ceremony held in Washington, D.C. The citation was given by the National Aeronautic Association in recognition of his significant contributions in advancing the science of aeronautics in this country and abroad. Earlier, in June, he had received a $25,000 cash award from the National Aeronautics and Space Administration, the largest single cash award ever given to a NASA employee.

In October of 1973 President Nixon presented him with the National Medal of Science, the nation's highest honorary scientific award.

"The National Medal has to be the honor that pleases me most," Dr. Whitcomb reports. "Of course I am very happy about the Wright Brothers Trophy, but the National Medal has a special meaning for me."

Dr. Whitcomb also won the prestigious Collier Trophy for the "greatest achievement in aviation in America" in 1954; the Exceptional Service Medal of the Air Force in 1955; the first Distinguished Service Medal to be presented by the National Advisory Committee for Aeronautics (NASA's predecessor) in 1956; the U.S. Junior Chamber of Commerce Award designating him as one of the ten outstanding young men in America, also in 1956; the NASA Scientific Achievement Medal and the Sylvanus Albert Reed Award from the American Institute of Aeronautics and Astronautics (AIAA) in 1969. He was elected a Fellow of AIAA in 1971. At 35, he was one of the youngest people ever to receive an honorary doctor of engineering degree from WPI.

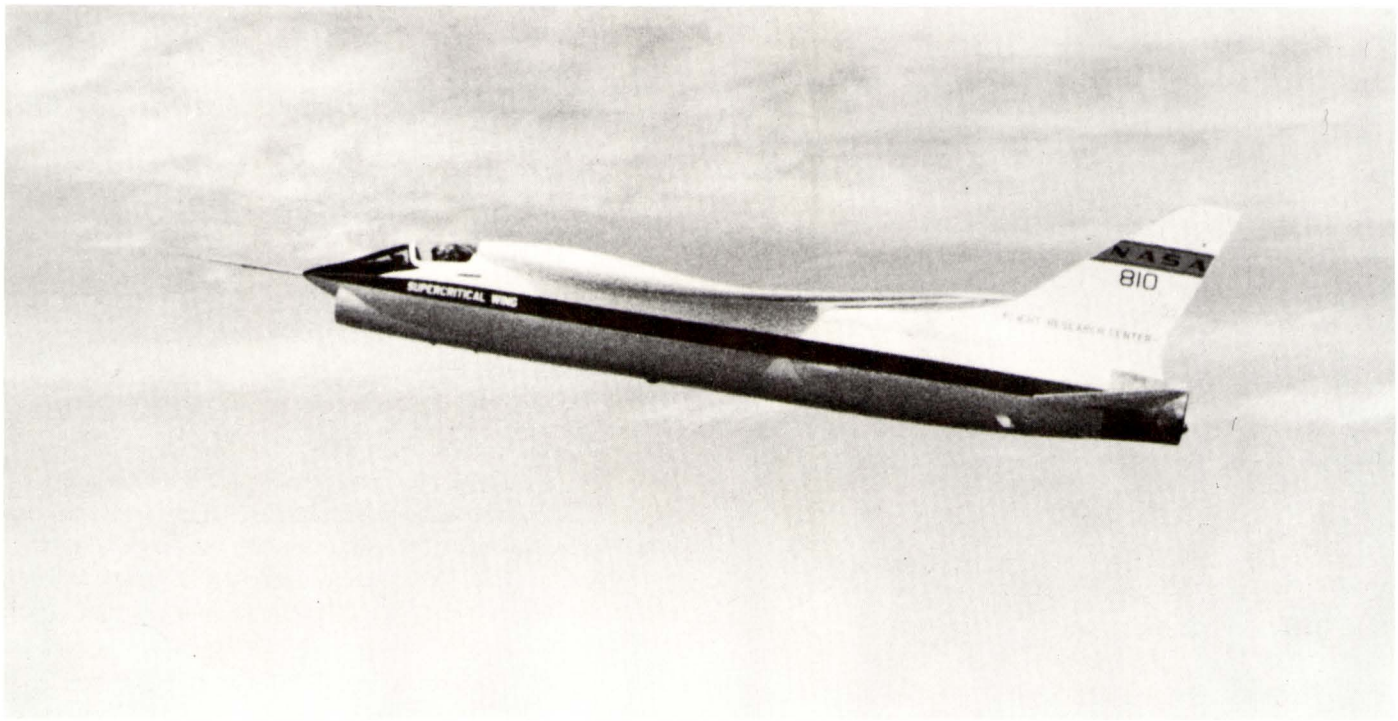
It was considerably more than luck that brought this parade of awards to Dr. Whitcomb's doorstep. An internationally known aerodynamicist, his research contributing to the advancement of flight in the United States was what earned him the honors.

After graduating "with high distinction" from WPI in 1943 and receiving the degree of bachelor of science in mechanical (aeronautical) engineering, he joined the staff of Langley Research Center in Hampton, Va. In 1956 he was appointed head of the 8-Foot Tunnels Branch of Langley's High Speed Aircraft Division. He undertook the responsibility of supervising the development of means for improving aerodynamic performance of aircraft at transonic speeds and the practical application of these improvements to specific aircraft.

In 1952 he discovered and later experimentally verified a revolutionary aircraft design concept called the area rule. This is a method of designing aircraft to reduce drag and increase speed without the addition of power. The resulting "coke bottle" shape fuselage is now incorporated into every American supersonic airplane.

Dr. Whitcomb also invented the NASA's supercritical wing, conceived at Langley as a result of wind tunnel studies conducted during the late 1960's. The wing has been tested in flight at NASA's Flight Research Center, Edwards, Calif., on a modified F-8 jet fighter aircraft. If successfully applied to future aircraft, particularly to commercial jet transports, the wing offers the promise of improved performance and efficiency in cruise flight close to the speed of sound. NASA anticipates that subsonic performance gains will be possible through use of the wing on supersonic military aircraft.

Both the experts and the commercial airlines agree about the potential of the Whitcomb wing. It has been estimated that through the use of the wing, the improved performance could save the airline industry $300 million a year in fuel bills alone. However, the airlines aren't rushing out to have planes built equipped with the new wing. Not because it has any known defects. It's been thoroughly tested. But the industry has been hurt by spiraling fuel prices and oil shortages. In order to save that $300 million in fuel annually, the airlines would have to shell out many more millions for planes with the supercritical wing. The experts say that it will probably take at least five



years and the loss of over $1 billion in fuel that could have been saved, before planes with the Whitcomb wing will be in use. "If fuel prices skyrocket again or if there's another Arab oil embargo, the airlines might consider equipping their old planes with the new wing," says Dr. Whitcomb.

The Whitcomb-designed wing helped to solve a problem that had troubled aeronautical engineers for years. When subsonic planes reached their maximum speed of over 600 miles per hour, they experienced drag and buffeting and a loss of stability. Air moving over the wing's upper surface reached supersonic speeds while the plane was traveling at a slower rate. To minimize these problems, the planes were flown at slower speeds which decreased their performance and efficiency.

Dr. Whitcomb admits that he is no mathematical genius and reports that he relied mainly on his intuition in searching for an answer. He experimented with a wing that had a flatter upper surface. Wind tunnel tests indicated that the redesigned wing slowed down airflow. As a result, there was less drag and buffeting. It would ultimately mean more aircraft stability at transonic speeds.

Currently Dr. Whitcomb serves as head of the Transonic Aerodynamics Branch in Langley's High-Speed Aircraft Division. And it looks as though he intends to stay there, in spite of tantalizing offers from the aircraft industry.

"We researchers have what we like at Langley," he says. "Independence. In private industry you can't think ahead and you have to worry about contracts."

It was this kind of dedication that enabled Dr. Whitcomb to become one of the top aerodynamicists in the world. It was also one of the reasons why he was the recipient of his latest award, the coveted Wright Brothers Memorial Trophy, given for "significant public service of enduring value to aviation in the United States."

The trophy, a miniature silver replica of the original Wright brothers' airplane, was presented to Dr. Whitcomb at the Wright Brothers Memorial Dinner in Washington last December. On one of his many lucky days. Friday, the 13th.

WPI

Dave Emery goes to Congress, maybe . . .

The original title of this article was "Dave Emery goes to Congress: You can get there from here." And when we wrote it in early December, that did appear to be the case. At press time, however, with about 12,000 contested votes involved in a suit by Emery's opponent, no one knows who will be finally seated in the House, and there is some possibility that the issue won't be settled until June.

So as not to lose time, Emery has moved to Washington and begun putting together his staff. His opponent, of course, is already ensconced there. But regardless of the final outcome of the election, we think you'll find Dave Emery's story interesting, so we're printing it the way we originally wrote it, with only this introductory disclaimer.

YOU WOULD EXPECT that WPI's first alumnus to be elected to the U.S. Congress would most likely be a liberal Democrat with plenty of financial backing. It would almost go without saying that he was middle-aged and professionally prominent in business, legal, or industrial circles. Almost.

David F. Emery, '70, of Rockland, elected last November from Maine's First Congressional District, should be all of those things. In fact, he is none of them. He is a conservative, 26-year-old Republican who turned a shoestring campaign against a four-term Democratic incumbent into a ticket to Capitol Hill. And as for his being professionally prominent . . . "My only jobs since graduating from WPI have been part-time ambulance driving and doing electronics work for a friend," he reports.

David Emery hasn't had time to pursue another career. While still an undergraduate electrical engineering student at WPI, he entered the primaries to represent Rockland in the state legislature and defeated a 22-year incumbent by a vote of nearly 2 to 1. He had no Democratic opponent in that 1970 election, but he went on to win the seat again in 1972.

Besides representing his constituents, Emery decided to actively seek Maine's First District Congressional seat last year. Financially, his campaign was a trial from the start. He came to be known as the most poverty-stricken candidate running for any major Maine office.

Emery, a bachelor who lives with his mother, estimates that in 1973 he earned about $7,000 with more than half coming from legislative service and the rest from his part-time jobs. Last year he subsisted almost entirely on his legislative pay.

"I still had $1,000 in the bank last January," he recalls, "but by September there was only about $5 left." Eventually he had to borrow $2,500 to live on and $2,000 more for campaign expenses. His largest contributions were two $500 donations and a $3,000 down payment on the state GOP's pledge.

After looking at the state of his general finances, Emery decided to wage a "Walking to Congress" campaign. Shoe leather, after all, costs less than TV time. "Besides, it was a poor year to ask anyone to invest in a Republican politician," Emery admits wryly. So he walked some 600 miles around his district, rang 200 doorbells a day, and shook over 16,000 hands. "The shoe-leather technique wasn't a gimmick, either," he says. "Walking is the only way you can get to know the people."

One of the most amazing facts that he learned from his campaign was that most of the people who shook his hand had never met a politician before in their lives. Evidently the people liked what they saw in politician Dave Emery. In half an hour as he trekked down one Main Street, four strangers volunteered to work on his campaign. Everywhere along the route he and his small staff were offered refreshments.

Emery took his people-to-people campaign right to the voters' doorsteps. Nearly every day he rang 200 doorbells. If anyone answered, he'd say, "Hi! I'm Dave Emery, running for Congress against Peter Kyros. Just wanted to come by and say hello." If nobody was at home, he'd scribble a "Sorry I missed you" note and leave it inside the screen door. "When they got back home at night, they all knew I'd been to see them . . . in person," he recalls. On November 5, the shoestring walking campaign paid off as he managed to squeak by his four-term Democratic opponent by a few hundred votes.

Emery feels his political drive came from his grandmother. Sarah Philbrick of Rockland, now in her 90's, often discussed political affairs with her grandson when he was scarcely more than a toddler. Although she was never active in politics herself, her interest in the subject was passed along to willing ears.

Back in 1956, when he was only eight years old, Emery's budding political interest in Eisenhower stirred him to stay up past his bedtime with a radio tucked beneath his blanket so he could find out how his hero was faring in the election returns. At 13 he knocked on doors in Rockland as a Teen-Age Republican (TAR.) Later he became TAR's First Congressional District chairman. While at WPI, he was adviser to Worcester County Young Republicans. He also served as a campaign worker for Massachusetts' former governor John Volpe and Senator Edward Brooke.

What really channeled him into a political career was his stint as a page at the GOP national convention in Miami Beach in the summer of 1968. "That was right after my sophomore year at WPI," he remembers. "I'll never forget that summer as long as I live. The convention was the most exciting thing that ever happened to me."

As he watched the senators and congressmen walk through his hotel lobby, he decided then and there to run for office during the next election. The opportunity cam up in 1970, when he was a senior at WPI. By spending his weekends in Maine politicking, and directing his campaign from WPI weekdays, he scored his first big upset, winning the representative seat from Rockalnd by a margin of 2 to 1. He hasn't lost an election since.

How do the hometown folks feel about their brand new congressman? In a word, proud. "Even as a teenager, Dave stood out as a young man going places," says a former school teacher. Sincere, exceptionally mature, and high principled are other descriptions.

"As a youngster he was already interested in people and business," reports his mother, Mrs. Albert O. Emery, a registered nurse. "When he was only five he operated a small parking lot for summer visitors right next to our house. By the time he reached junior high school, he was earning $200 a summer from the lot. It helped him to develop business sense. He also learned how to meet people."

In January, Congressman David Emery took his Yankee-honed business sense, his ability to meet people, and his hiking shoes to Capitol Hill. Only time will tell how far they take him. WPI

The data on which these class notes are based had all been received by the Alumni Association before December 15, when it was compiled for publication. Information received after that date will be used in succeeding issues of the WPI JOURNAL.

1903

Henry J. Potter writes that his new home address is 26 Sheffield Road, West Yarmouth, Mass.

1908

Herb Carleton's wife, Myrtis, died on July 28, 1974, following an illness of several months. Class Secretary **Donald D. Simonds** writes: "They were a great couple and were fortunate in a companionship of nearly 65 years."

1910

The **George F. (Hap) Martins** have moved to 152 Sherbert Rd., Ashburnham, Mass. 01430. Hap is recuperating at Heywood Memorial Hospital in Gardner, Mass., following extensive surgery.

1919

George R. Rich received honorary membership in the American Society of Civil Engineers at the annual National Environmental Engineering Convention held in Kansas City, Mo. last October. He is a senior vice president and director of Chas. T. Main, Inc. During his career he has supervised numerous hydroelectric and water-control projects including the Cape Cod Ship Canal and the TVA.

1921

Mr. and Mrs. **Fred Weitzen** of San Diego, Calif., recently celebrated their 50th wedding anniversary. Mr. Weitzen retired as chief court reporter of the Municipal Court in 1962.

1923

Recently **J. Carleton "Pop" Adams** and his son, Jack, '50, were spotlighted in the Connecticut General Life Insurance Co. magazine, *View*. In the story Pop tells how he rechanneled his career from civil engineering to insurance.

"I'd been doing bridge design work in the Pittsburgh area for about 10 years when the depression hit," he says. "Engineering looked pretty slim in those days so I decided to switch fields."

Insurance sounded like a natural to him. He already had a couple of Connecticut General policies, so he went to the C.G. office in Pittsburgh to investigate the possibility of selling.

"The time was right," Pop explains. "I was the first person hired when the estate planning philosophy was beginning to take shape."

Pop says switching from engineering to insurance isn't as great a change as one might think, for problem-solving exists in both fields.

"Whether you work with concrete and steel or with money management, it doesn't make much difference," he claims. "Either way you are building a structure to solve problems."

After learning to sell using the estate planning philosophy, Pop joined the C.G. staff and did tax consulting together with research and program design work with the agents. His contributions to the Field Technical Committee helped form a bridge from package selling to estate planning.

Pop's interest in WPI and success in the insurance field made a strong impression on his son **John R. "Jack" Adams, '50,** who followed him to WPI and later into a career with Connecticut General. According to his father, Jack says his two years at WPI have put him way ahead of others in knowing how to attack and solve problems.

Currently Jack is an assistant manager and personal producer in Indianapolis. Previously he held staff positions in Hartford and Kansas City.

1924

Warren B. Fish has been appointed to the Connecticut State Historical Commission by Governor Thomas J. Meskill. The post includes automatic membership on the American Revolution Bicentennial Commission which will coordinate celebration activities for the nation's 200th birthday in 1976. . . . **Frank Linsley** of Thomaston, Conn., was elected pre-eminent governor at the annual meeting of York Rite College (17). He began his Masonic career in St. Andrew's Lodge (64) in Winsted, Conn., in 1936 and since then he has been awarded a number of medals in recognition of his distinguished service to Masonry. He was employed by utility companies in Massachusetts, New York and Connecticut. He retired as transmission and distribution engineer for the Hartford Electric Light Company.

1927

Bradford M. Bowker is a special building inspector for the Clark County Building Department in Las Vegas, Nevada. . . . Last August **Charles MacLennan** retired from the staff of Harza Engineering Co., Chicago, where he had held the post of utilities engineer. Following a vacation in England, Spain and Canada, he joined the Canadian Executive Service Overseas' Organization in October for an assignment in Brazil. He is based in Florianopolis where he is serving in an advisory capacity in connection with electrical development in the state of Santa Catarina.

1929

Brian J. O'Connell, son of **Andrew J. O'Connell,** has passed the Massachusetts Bar exam. He was one of 989 state residents who passed the test out of 1,290 applicants. Andy has retired from the Worcester Academy faculty and lives in Worcester.

1931

George W. Smith, who was with Factory Insurance Association, Philadelphia, for many years, has retired. Presently he is located in Tuckerton, N.J.

1932

Timothy D. Crimmins retired as chief plant engineer last March from CF & I Steel Corp., Roebling, N.J.

1936

C. Norman Svenson continues with G.E., but is now located in Wilmington, Delaware.

1938

Richard M. Stuart is currently with G.E.'s Telecommunication Products Department in Lynchburg, Va.

1939

Walter L. Longnecker holds the post of vice president-international at Gould, Inc., in Chicago. . . . **Ernest L. Sykes** writes that not only is he serving a year with VISTA, his wife is serving also. A registered nurse, she is working in a clinic in Española, N.M., one of several operated for agricultural workers in the underdeveloped and depressed northern area of the state. Ernie works with non-profit Development and Support Corp. in Española, which is set up to assist small rural communities to obtain new or upgrade old domestic water systems. This includes applications for grant money and loan money, engineering feasibility studies, final engineering and construction drawings, and construction inspection. If the community association wishes, the corporation can also furnish them operating and maintenance service as well as billing and accounting services. As VISTA volunteers, the Sykses are paid just enough to cover food, lodging, and

personal expenses so that they can live at the subsistence level of the people with whom they are associated. They are considering extending their service period with VISTA, finding the work adventuresome and challenging.

1941

Paul G. Bonin currently serves as manager-technical service international at Union Carbide Corp., Wayne, N.J. . . . **Charles L. Hoebel** is the Washington, D.C., representative for Carrier Corporation. . . . **Arthur J. Jackson** is with Peabody Engineering Corp., Stamford, Conn.

1942

Charles D. Berry works as a senior sales engineer at Addelco Corp., Needham, Mass. . . . **Joseph N. Christian** is a sales engineer at Priority Systems, Inc., Covina, Calif. . . . **James F. Robjent,** purchasing manager of Scott Paper Company's Northeast operations, has been awarded the title of certified purchasing agent by the National Association of Purchasing Agents. The award is based on academic achievement, experience in the purchasing field, contributions to the professional aspects of purchasing and completion of several written examinations. He has been purchasing manager since 1954. Previously he worked in H & W's Boston office.

1946

Edward A. Pendleton owns and operates Pendleton Fire Brick Co., Bloomfield, Conn. . . . **J. Larry Stewart** is the owner of Stewart Technical Sales in New York City. . . . **Malcolm K. White** holds the post of pollution control director at Pervel Industries, Inc., Plainfield, Conn.

1947

Paul D. O'Donnell is general manager in the Tampa (Fla.) Division of Westinghouse Electric Corp.

1948

Charles F. Jones serves as president of Nuclear Utility Service Corp., Rockville, Md. . . . **William G. Ritchie,** vice president of STV, Inc. (consulting engineers), in the Washington, D.C. office, has been appointed federal government marketing manager. Formerly he was president of another STV firm, Environment & Technology Assessments, Inc. He will remain in Washington in his new assignment as marketing consultant on federal projects nationwide. He joined Sanders & Thomas in 1962 and was elected a vice president of STV in 1972.

1949

Francis J. Bigda presently serves as sales manager at Semicon, Inc., in Burlington, Mass.

1950

Prof. **Richard Beschle** of the life sciences department at WPI was recently awarded the Silver Beaver award for outstanding service as a volunteer leader in the Boy Scouts. He is the camping and activities chairman of the Mohegan Council, cub master of Pack 102, committeeman of Troop 19, and the former cub master of Pack 27 in Auburn. He also has served as district chairman for the southwest council district, a member of the council executive board and chairman of camping and activities at the Treasure Valley Scout Reservation in Paxton, Mass. . . . Colonel **Frank W. Harding** is a member of the massive U.S. Air Force team that assisted in the development of the new B-1 strategic bomber. He is director of procurement at Wright-Patterson AFB, Ohio, with the B-1 systems program office which coordinated the work of more than 60 civilian contractors who helped design, develop and test the aircraft's systems. The B-1 will be the successor to the Strategic Air Command's B-52 Stratofortress.

1951

Maurice Gosselin serves as materials flow manager at Dow Corning Corp., Midland, Michigan. . . . **Walter J. Kolodne** is a builder-developer with Multiplex Corp. of Virginia in Alexandria. . . . **Duncan W. Munro,** superintendent of Mount Auburn Cemetery, Cambridge, Mass., was recently elected second vice president of the American Cemetery Association at the national trade group's convention in Las Vegas, Nevada. The post includes membership on the executive committee. Munro has served as a director of ACA and written numerous articles for the association's journal.

1953

Richard A. Davis has been promoted to vice president and general manager of the Thermos Division (King-Seeley) operations within the United States. He joined the firm in 1973 as director of manufacturing. From 1953 until 1973 he was associated with the General Electric Co. He was manager of manufacturing at the G.E. Portland, Me. generation products facility prior to accepting a position with Thermos. . . . Dr. **Robert W. Fitzgerald** of WPI's civil engineering department is one of four speakers sponsored by the National Fire Protection Association who have been traveling around the country lecturing on the safety features that are needed in high-rise buildings.

1954

Joseph J. Fratino is manager of engineering services at Columbia Gas Transmission Corp., Charleston, West Virginia.

1955

Currently **Harold S. Sauer** holds the position of vice president of Medical Innovations, Inc., Waltham, Mass.

1956

Richard J. Emery works as manufacturing superintendent at E.I. duPont in Old Hickory, Tenn. . . . **George P. Strom** was recently appointed director of materials management at Ortho Diagnostics, Inc., a subsidiary of Johnson & Johnson. He is responsible for distribution services, purchasing, production planning and materials handling. A past president of the Cranford (N.J.) Board of Education, he has also been involved with Little League football, the Boy Scouts, and the United Fund drive.

1957

Robert P. Engvall has been appointed director of facilities and construction at Connecticut Mutual Life in Hartford, Conn. Previously he was superintendent of manufacturing services at Astra Pharmaceutical Products in Worcester. . . . **Paul J. Kerrigan** serves as executive vice president at Gerald Rosen Co., Inc., in Framingham, Mass. . . . **Arthur Nedvin** was recently named director of plans and controls for IBM World Trade Asia Corporation. For the next two years the Nedvins and their three children will be living in Tokyo, Japan. . . . **Edward A. Stucke** is now with G.E.'s Ordnance Department in Pittsfield, Mass.

1958

Robert F. Bernado has retired as a lieutenant colonel from the U.S. Air Force and is currently located in Nashville, Tenn. . . . **William S. Brower, Jr.,** is automation consultant at Control Data Corp., Glastonbury, Conn. . . . **Michael S. Gutman,** formerly with Digital Marketing Associates, has been appointed marketing manager, Component Computers, for the Digital Equipment Corp. in Marlboro, Mass. He will be responsible for all aspects of the marketing and sales support program for microprocessors and other modular computers sold by the Components Group. . . . **Richard M. Wiberg** serves as a senior process engineer at Nekoosa Edwards Paper Co. in Port Edwards, Wisconsin.

1959

Burnham H. Baker holds the post of vice president at Inforex, Inc., Burlington, Mass. . . . **Robert A. Berg** is now a factory manager for Rexnord. . . . **Peter K. Bertsch** serves as manager, food packaging engineering, at Sweetheart Plastics, Wilmington, Mass. . . . Dr. **Norman A. Hiatt** is a senior research engineer at Norton Co., Worcester. . . . **John R. Mack** works for Curtiss-Wright Corp., Wood Ridge, N.J. . . . **Windle B. Priem** recently received an award from the U.S. Small Business Administration for directing the agency's outstanding region for 1974. He is regional director of SBA's Region II which includes New York, New Jersey, Puerto Rico and the Virgin Islands. During the fiscal year ending last June 30th, Region II approved loans totaling $281,310,000 and trained and counselled more than 20,000 people.

1960

Michael J. O'Toole, Jr., is chief, Bureau of Water Quality Planning, for the New York State Department of Environmental Conservation in Albany. . . . **Edward J. Russell** is with Group Executives at General Electric Co. in Bridgeport, Conn.

1961

Born: to Mr. and Mrs. **John A. Quagliaroli,** a son, James John, on October 3, 1974. John is with First National City Bank in Cambridge, Mass.

Harold W. Alatalo has joined General Electric in Binghamton, N.Y. . . . **Henry P. Allessio** is now the director of marketing and planning for Geon Industries, Inc., Woodbury, L.I., N.Y. Geon is on the American Stock Exchange and is the country's largest independent importer and distributor of replacement parts, specializing in foreign cars. Allessio was formerly a principal in the firm of William E. Hill & Co., Inc., New York City, a part of the management consulting division of Dunn & Bradstreet. With his wife, Judi, and daughters, Darlene, 9, and Suzanne, 2, Allessio resides in Pelham Manor, N.Y. . . . Currently **Richard J. Baker** is pastor of the First Presbyterian Church in Avonmore, Pa. . . . The Rev. **Roger R. Borden,** associate professor of mechanical engineering at WPI, has been appointed pastor of the Fitchburg (Mass.) United Methodist Church. He is an ordained deacon of the Methodist Church and is presently completing work for eligibility as an elder. . . . **Richard D. Cohen** is an account executive at Thomson & McKinnon, Auchincloss Kohlmeyer, Inc., in Baltimore, Md. . . . **Nino M. DiPilato** serves as a staff engineer at IBM Corp., Hopewell Jct., New York. The DiPilatos have two children, David, 2½, and Michael, 6 months.

1962

Born: to Mr. and Mrs. **Joel L. Gordon** a daughter, Jennifer, on June 21, 1974. Gordon is a self-employed environmental consultant in San Juan, Puerto Rico. . . . to Mr. and Mrs. **John V. Meregian** a daughter, Nicole, on November 23, 1974. Nicole has an older sister Tanya, 3. Meregian is quality control manager for the Northern Manufacturing Division of Kendall, a subsidiary of Colgate, in Walpole, Mass.

Albert C. Andrews serves as corporate director, production control, at Western Publishing in Racine, Wisconsin. . . . The Rev. **Paul W. Goranson** has been assigned to Grace Episcopal Church, Oxford, Mass., as an assistant to the vicar. Earlier he was with the Peace Corps in Ghana, taught math, physics and chemistry in Massachusetts and North Carolina and did community development work with the U.S. Agency for International Development, in Vietnam. He recently received his master of divinity degree from General Theological Seminary in New York City. He was ordained a deacon last June. . . . **John M. Samborski** is currently administrative assistant to the vice president of colors and chemicals at BASF Wyandotte in Parsippany, N.J. . . . Capt. **John R. Tufano** is now stationed at Rock Island, Ill., at the U.S. Army Armament Command.

1963

Richard L. Alling has been promoted to assistant superintendent of pressed metal products at Torrington (Conn.) Co. Since joining the company in 1964, he has served as an engineer in bearing production, concentrating on thrust bearings. . . . **Carleton "Pete" Borden** now works as an orlon planning assistant at DuPont in Wilmington, Delaware. . . . **James D. Clark** is a marketing product manager for Xerox Corp. in Dallas, Texas. . . . **Robert F. Grenier** was recently elected vice president for engineering at Quabaug Rubber Co., North Brookfield, Mass. He joined the firm as a plant engineer in 1968. . . . Dr. **Francis E. Kennedy, Jr.,** is an assistant professor of engineering at Thayer School of Engineering, Dartmouth College, Hanover, N.H. . . . Dr. **Frederick L. Kubick,** who earned his PHD in physics from the former Polytechnic Institute of Brooklyn, is currently employed as a sonar systems analyst and consultant at Sperry Rand Corporation, Systems Management Division, in Great Neck, N.Y.

1964

Dr. **Paul G. Amazeen** holds the post of director of engineering at Rohe Scientific Corp., Santa Ana, Calif. . . . **Richard R. Brown** has been promoted to the new post of manager of corporate information and advertising in the communications department at Data General Corporation, Southboro, Mass. He will be responsible for overall press relations, corporate advertising, employee communications and recruitment advertising. Previously he was manager of advertising and sales promotion. He began working for the firm in 1970 as a public relations specialist. . . . **Wade W. Cloyd,** SIM, has been promoted to the position of director of corporate communications for the American Optical Corp. He was the director of marketing services for the optical products division. Now he will be responsible for development and administration of communications policies and activities for the company. He joined AO in 1958 as a manager of sales promotion in the advertising department. Later he was manager of advertising and public relations and director of marketing services. . . . **Peter L. Dornemann,** business development manager for the Industrial Chemicals Division at NL Industries, Hightstown, N.J., has been slated to visit WPI as a company recruiter in February. . . . Currently Lt. Col. **David Y. Healy,** USMC, is stationed at El Toro, Calif. . . . Dr. **Steven D. Mittleman** is an assistant professor in the EE Department at the University of Maine in Orono. He received his PHD from Brown last year. . . . **Robert E. Mournighan** has accepted the position of day supervisor polymer at the Front Royal (Va.) plant of FMC Corporation. He recently joined the company as a process engineer in the Polyester Process Improvement Department. Earlier he was a process development engineer with the Goodyear Tire and Rubber Company where he was responsible for pilot plant development work and process trouble shooting in plant operations. . . . Dr. **Alfred R. Potvin,** chairman and associate professor of biomedical engineering at the University of Texas at Arlington, has been selected by NASA to participate as a life scientist at Ames Research Center, Moffett Field, Calif., for one year. He will investigate space motion sickness, one of the major biomedical problems in manned space flight.

. . . **John H. Schmidt** has received his professional engineering license in New York state. . . . Presently **Peter J. Tancredi** works as a component manager at Camp Dresser & McKee, Inc., Denver, Colorado.

1965

Born: to Mr. and Mrs. **John (Jack) Kelley,** their first son, last March. They also have a four-year-old daughter. Jack was recently promoted to construction division director at Stewart and Williams of Augusta, Me. He is responsible for the construction of $28 million worth of work now under contract. A professional engineer, he has been with the firm since 1970, serving as a construction project manager.

James Calvin works as a clinical psychologist at the National Naval Medical Center in Bethesda, Md. . . . **Paul L. Giusti** has assumed the position of sales manager for General Electric Company's capacitor products department which is located in Hudson Falls, N.Y. . . . **James B. Gustafson** serves as computer facilities manager at Chas. T. Main, Inc., Boston. . . . **Peter B. Kirschmann,** now a manager-manufacturing engineering for G.E., is located in Merrimack, N.H. . . . Dr. **Peter S. Welcker** serves as a chemist for duPont at their Washington (W. Va.) works.

1975 ENGINEERING GRADUATES

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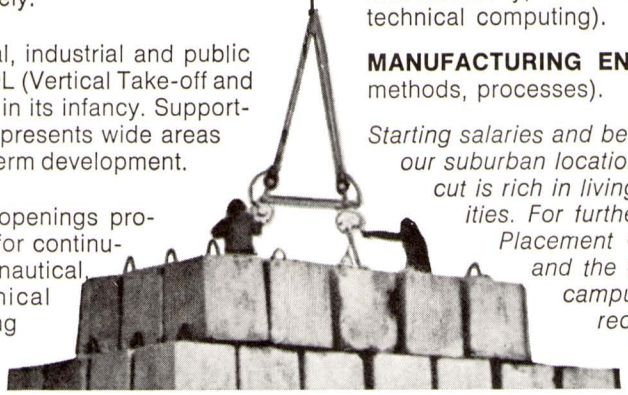

DESIGN (aircraft structures; propulsion systems; transmissions; rotor, hydraulic & flight control systems; electrical/electronic systems).

TEST AND ANALYSIS (structural, loads, dynamic, stress, mass properties, reliability/maintainability; electrical/electronic systems; technical computing).

MANUFACTURING ENGINEERING (planning, methods, processes).

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. . . **John H. Zifcak** is now process group manager at the Foxboro Company plant in East Bridgewater, Mass. He is responsible for the production, materials, planning and engineering of the process lines which include etched circuit boards, cable and transformers. He has been with the firm since 1967 and has served as a staff assistant in development and engineering and as engineering manager at the East Bridgewater plant which manufactures electronic assemblies. Previously he taught high school physics and chemistry in Rhode Island.

1966

Married: **Robert B. Dolan** and Miss Mary S. Hussey recently in Manchester, New Hampshire. The bride, a teacher, graduated from Paul Smith Junior College and Notre Dame College, Manchester, N.H. The bridegroom is presently a product engineer with GTE Sylvania.

Krikor D. Gureghian serves as a senior process engineer at Fluor Corp., Los Angeles, Calif. . . . **Jonathan H. Pardee,** a general agent for Occidental Life Insurance Co. of California, also is an associate at G. Nolan Bearden Co. (insurance brokerage) in Atlanta, Ga. . . . **Lawrence A. Penoncello** has been appointed manufacturing manager of The Wire Mill Division at Torrington (Conn.) Co. Originally hired in 1967 as a manufacturing engineer at the Standard plant, he was transferred to the Broad St. plant in 1968 as a general foreman. Since that time he has been in overall charge of several departments. . . . **Carl E. Hellstrom** was recently named the principal regional transit planner for the Central Massachusetts Regional Planning Commission. He spent the past two years in the City Manager's Office of Planning and Community Development as a senior transportation planner and was active in the study leading to the creation of the Worcester Regional Transit Authority. Earlier he was an instructor at WPI.

1967

Born: to Mr. and Mrs. **William R. Hyatt** their second daughter, Anna Marie, on June 29, 1974. Bill is now employed by Stearns-Roger Engineering Company, Denver, Colorado.

Roger C. Binkerd is director of hydrographic studies at Aquatec in Burlington, Vt. Earlier he had worked for Stone & Webster in Boston and had served in the Peace Corps in Africa. The Binkerds have two children, Lisa, 4, and Chad, 3. . . . **Paul Cherubini** has been named vice president in charge of operations at the Standard Sign and Signal Co., Inc., in Clinton, Mass. He joined the company four years ago. He had been with the Carlson Construction Company in Cochituate and the Badger Engineering Company in Cambridge. . . . **Peter M. Herron,** a business planner at Hughes Aircraft, El Segundo, Calif., performs financial analyses and other business studies supporting the sale of commercial communications satellites. He received his MBA from the University of Denver last year. . . . **James C. Lefevre** is a self-employed land manager in the eastern United States. . . . **Douglas H. Pike** is studying for his PhD at Boston College . . . **William E. Tanzer** works as a project engineer at Eastman Gelatine Corp., Peabody, Mass. . . . **Wayne T. Wirtanen** has been appointed chief of the newly formed Water Compliance Section of the U.S. Environmental Protection Agency's regional enforcement office. He will be responsible for the technical aspects of compliance with national pollutant discharge elimination system permits including investigations for noncompliance and commencement of enforcement actions. Wirtanen is a registered professional engineer and has worked in the technical studies section of EPA's Surveillance and Analysis Division since 1972.

1968

Born: to Mr. and Mrs. **Marshall B. Taylor** a son, Prescott, on January 6, 1974. Marsh is manager of capital planning at Ryder Systems, Inc., Miami, Fla.

Kenneth D. Ekstrom recently took part in an expedition off the North Coast of South America. He is with the department of oceanography at the University of Rhode Island in Kingston. . . . **Stephen M. Holub** is regional sales engineer at Union Carbide/Linde Division, in Houston, Texas. . . . **Richard E. Makohon** is a student at the University of Alabama. . . . **Stephen M. Pytka** currently works in the Ordnance Department at General Electric in Pittsfield, Mass. . . . **J. Kevin Sullivan** holds the position of marketing manager at Stanley Hydraulic Tools in Clackamas, Oregon.

1969

Married: **Bruce M. Green** and Miss Patrice A. Piccolo on October 26, 1974 in Stonington, Connecticut. Mrs. Green graduated from Southern Connecticut State College and is a learning disabilities Teacher at Washington Junior High School in New Britain. The groom is a mechanical engineer-product engineer at Hartford Special Machinery Co. in Simsbury. . . . **Harold F. Hemond** to Miss Carol A. Thomson in Ledyard, Connecticut on August 10, 1974. The bride graduated from George Mason University and earned her MA at Connecticut College. Her husband, who received his MA in botany at Connecticut College, is now working for his PHD at M.I.T. Previously he was employed as deputy director of Water and Related Resources for the state department of Environmental Protection. . . . **Douglas H. Morash** amd Miss Denise Hillick of Ithaca, New York, on November 9, 1974. The groom is writing his thesis for a PHD in mechanical engineering from Cornell University.

Richard Alpert has been teaching at the Tehran American School in Iran. . . . U.S. Air Force Captain **Warren L. Anderson** has been certified as a missile combat crew commander at Grand Forks AFB, N.D. Capt. Anderson, a missile launch officer with more than four years service, was recommended for upgrading by his wing commander after meeting all training and evaluation requirements. . . . **Ralph N. Clemons** serves as an application engineer at Measurex Corporation in Portland, Maine. . . . **Joseph E. Fitzgerald, Jr.,** is now employed by Lockwood Greene Engineers, Inc., Spartanburg, S.C. . . . **Alfred G. Freeberg** works for General Electric Co. in Pittsfield, Mass. . . . **Stephen Legomsky** is a student at the University of San Diego (Calif.) School of Law. . . . Also studying law is **Richard P. Romeo** who is at the University of Maine in Portland. . . . **Francis W. Skwira** writes that he left G.E. last April. Now he is permanently assigned in Atlanta with Ebasco Services, Inc. The Skwiras recently settled in their new house in Lilburn, Ga.

1970

Married: **George M. Iszlai** to Miss Karen D. Baker on October 5, 1974 in Nashua, New Hampshire. The bride attended UNH and graduated from Youville Hospital School of Nursing, Cambridge, Mass. The groom received his master's degree from UNH. . . . **Robert J. Killion, Jr.,** to Miss Sharon L. Orciani on October 27, 1974 in West Boylston, Massachusetts. Mrs. Killion graduated from Ollis Beauty Academy and is a hairdresser. Her husband is vice president of Killion Co., Inc., Worcester. . . . **James P. Troupes** and Miss Marlene M. Garbauskas on October 26 in Worcester. Mrs. Troupes attended Clark University. The bridegroom is the town engineer in Milford, Mass. . . .

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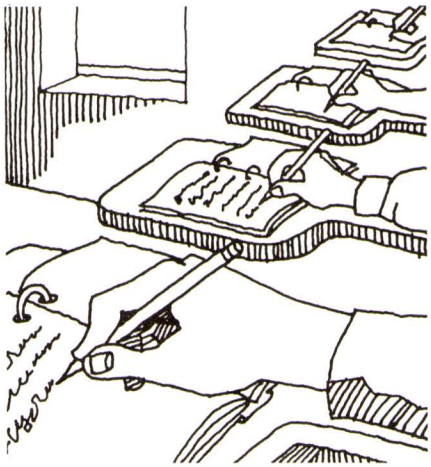

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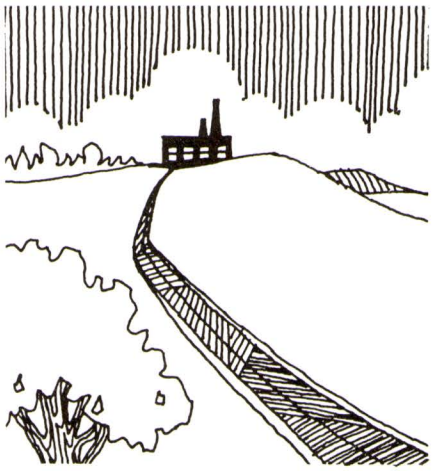

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Air Force 1/Lt. **Kenneth C. Bassmann** has been assigned to Ft. Meade, Md., for duty with a unit of the U.S. Air Force Security Service. He is a communications-electronics operations officer with the 6970th Air Base Group. Previously he was assigned at Takhli Royal Thai AFB, Thailand. He was decorated with the U.S. Air Force Commendation Medal for meritorious service in Thailand. . . . **Richard E. Bergeron** is with Engineered Specialty Products in Frazer, Pa. . . . **Wayne Eastman** works as a plant engineer at Allied Chemical in Columbia, S.C. . . . **Dom Forcella** writes: "I am an unemployed Czar recovering from a wound received from a flying vector." . . . **Peter G. Hancock** is a group manager at GTE Labs, Inc., Waltham, Mass. . . . **Ted Lelek** serves as a national accounts representative at Gulf Oil Chemicals Co., New York City. . . . **Bradford R. Myrick** is a design engineer at Improved Machinery, Inc., Nashua, N.H. . . . **Frank Pope, Jr.** currently works as a design engineer for Stein Associates, Waltham, Mass.

1971

Married: **Philip Cianciotto** to Miss Donna-Rae Pasch on September 14, 1974 in Rochester, New York. The bride graduated from Beloit College and is employed by Leach Steel Corp. Her husband is a chemist with Eastman Kodak Co.

Born: to Mr. and Mrs. **Richard Arena,** a daughter, Nicole, on May 28, 1974. Arena is a service specialist at Wyman Gordon, North Grafton, Mass.

Robert J. Allard, Jr., has accepted a new position as vice president of Croman Development Company in East Orange, N.J., one of the largest commercial real estate developers in that state. . . . **George J. Bakevich,** who recently left the U.S. Atomic Energy Commission, has accepted a position in the Safety Review and Appraisal Branch of Aerojet Nuclear Company. Bakevich is responsible for nuclear criticality safety and some health physics work. He is currently located in Atomic City, Idaho (population: 39). . . . **Thomas R. Copp** now serves as plant engineer at Rexnord, Inc., Maynard, Mass. . . . **Robert R. Dutkiewicz** holds the post of plant metallurgist at National Standard Co., Worcester Wire Division. . . . Dr. **Baljit S. Gambhir** is a research engineer at MTM Process Research & Development Laboratory, Deer Park, Texas. . . . **Jack B. Greenshields** was recently promoted to superintendent of purchasing and traffic with the Monsanto Commercial Products Company, Stonington, Conn. He is also a signal center platoon leader with the Connecticut Army National Guard, holding the rank of first lieutenant. . . . **William E. Helliwell, Jr.,** has been promoted to district service manager for the Riley Stoker Corp. of Worcester. Previously the resident service engineer in Denver, Colo., he will be servicing the Rocky Mountain District for Riley Stoker, a major manufacturer in utility and industrial steam generators and air pollution equipment. . . . **Emile P. Levasseur** works for G.E. in Lynn, Mass. . . .

John V. Marino is a graduate student at WPI. . . . **Robert A. Payne,** a partner in the firm, National Legal Supplies, is also working for his MBA at the University of Utah in Salt Lake City. . . . **Francis M. Scricco** is associated with the Boston Consulting Group, in Boston. . . . **John H. Sieczkos** works for General Electric Co. in Binghamton, N.Y. . . . **Thomas Weil** attends the University of Massachusetts in Amherst where he is studying for his MS in ocean engineering.

1972

Married: **Samuel T. Cuscovitch** to Miss Patricia H. Block recently. The bride is a graduate of Central Connecticut State College and teaches in South Windsor, Conn. Her husband, a data communications analyst at Aetna Life & Casualty in Hartford, has received his MS in information science from RPI. . . . **John D. Kaletski** and Miss **Gwynne E. Peterson, '73,** on October 19, 1974, in Boylston, Massachusetts. Mrs. Kaletski is a staff supervisor in the engineering department of American Telephone and Telegraph Co., White Plains, N.Y. The groom is a chemical engineer at Clairol, Inc., Stamford, Conn. . . . **Brennan R. McLaughlin** and Miss Linda T. Lombardo on October 12, 1974 in Wethersfield, Connecticut. Mrs. McLaughlin graduated from Becker and is a secretary at Blue Cross-Blue Shield in Worcester. Her husband works for Stone & Webster, Boston.

Born: to Lt. and Mrs. **John D. Powers** their first child, James Kern, on October 22, 1974. Now a first lieutenant in the U.S. Army, Powers was recently transferred from Nürnberg to Worms, Germany.

Samuel T. Davis is an industrial engineer at Sweetheart Plastics, Wilmington, Mass. . . . **James N. DeVries** is chairman of the science and mathematics department at Dayton (Ohio) Christian Schools, Inc. . . . **Mark A. Fritz** serves as a quality assurance engineer at Sanders Associates in Nashua, N.H. . . . **Neil C. Herring** has joined the Graham H. Blake Agency in Bradford, N.H., where he is a field representative for the Berkshire Life Insurance Co. of Pittsfield, Mass. Earlier he was sales manager in Bradford for a newspaper chain and served in the same capacity for WRLH-TV in Lebanon. . . . Presently **Patrick F. Lafayette** is an assistant project engineer at C.E. Maguire, Waltham, Mass. . . . **Kathleen F. McCarthy** is an instructor in computer science at WPI. . . . **Richard N. Panton** has been promoted to supervisor, continuous polymerization, at duPont's Spruance Plant, Richmond, Va.

John T. Poreda has joined the Ordnance Department at G.E. in Pittsfield, Mass. . . . **Gus Sannicandro,** SIM, of Milford, Mass., has been elected chairman of the Industrial Development Commission. For the past seven years he has served as secretary of the IDC. . . . **John E. Swanson,** now out of the Air Force, is working as an analytical design engineer at Pratt & Whitney Aircraft, East Hartford, Conn. He also serves in the Massachusetts Air National Guard in Westfield, Mass. and is an F-100 pilot. . . . **Bruce M. Szypot,** who was released from active duty in the army on July 30, currently works as an industrial engineer in the Industrial Engineering Department at Eastman Kodak Company in Rochester, N.Y. . . . **Donald A. Taft** is a graduate student at Harvard Business School. Recently, as a lieutenant with the 76th Engineer Battalion, he was awarded the Army commendation medal for service.

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1973

Married: **William J. Ierardi III** and Miss Christine E. Ketchel on November 15, 1974 in Hamden, Connecticut. The bride is a licensed practical nurse. . . . **Donald H. Kray** to Miss Kathleen M. Sharry on October 5, 1974 in Worcester. Mrs. Kray is an administrative underwriter for Aetna Life & Casualty Co. The groom is an analyst for the same company in Hartford, Conn. . . . **William B. Smith, Jr.,** and Miss Mary Elizabeth Magee in Glenbrook, Connecticut on October 19, 1974. The bride is a graduate of Southern Connecticut State College. She and her husband are both associated with the Putnam Trust Company. . . . **Anthony R. Urjil** and Miss Robin Saltzman in Hartford, Connecticut on November 3, 1974. Mrs. Urjil is a Becker graduate. The groom is a sales engineer at Morse Chain Co.

Ben G. Allen is associated with Woods Hole (Mass.) Oceanographic Service. . . . **Crane D. Allen** is presently an electronics engineer with the Naval Underwater Systems Center (N.U.S.C.) in New London, Conn. N.U.S.C. is responsible for the development of sophisticated underwater detection, ranging and weapons systems for the U.S. Navy. . . . **Philip N. Ciarlo** has been employed by General Electric in San Jose, Calif. **Lawrence Dzaugis** works at Reed Rolled Thread Die Co., Holden, Mass. . . . **Bruce J. Foster** and **William T. Nutter** are with the Ordnance Department of General Electric in Pittsfield, Mass. . . . **Robert C. Haywood** is a proposal coordinator at Perkin-Elmer Corp. (Electro-Optics Div.) in Wilton, Conn.

Roger J. Heinen, Jr., is a programmer for Digital Equipment Corp., Maynard, Mass. . . . **Richard L. Kirk** holds the post of associate engineer at Galileo Electro-Optics, Sturbridge, Mass. . . . **Dale R. Ladysh** is a technical engineer at E.I. duPont & Co., Memphis, Tenn. . . . Airman First Class **Philip C. Mazzie** is a member of a unit that recently received the U.S. Air Force Outstanding Unit Award. He is a telephone equipment repairman at Wright-Patterson AFB, Ohio, with the 2046th Communications Group that was cited for meritorious service. . . . **Martin J. Sklar** is studying at Thayer School, Dartmouth College, Hanover, N.H. . . . **Edward M. Small** works as a junior engineer at Camp Dresser & McKee in Boston. . . . **John Taylor** writes that he is employed at the Echlin Manufacturing Co. in Branford, Conn., where he serves as an automotive emissions test lab supervisor.

1974

Married: **Michael J. Boyden** and Miss Sandra Jo Bishop on August 31, 1974 in Cape Vincent, New York. **John Young** served as best man. Mrs. Boyden, a physical therapist, recently registered in the state of Connecticut, is a graduate of Russell Sage. Her husband is an office engineer at a Stone & Webster field office, Millstone Nuclear Power Project, in Waterford, Conn. . . . **Gerald G. Buzanoski** to Miss **Kara B. Hogan** in October in Framingham, Massachusetts. The bride is with Nisco Co., Cherry Hill, N.J. and the groom with General Water Company, Toms River, N.J.

. . . **Kenneth Charak** to Miss Adrienne B. Lewis in West Hartford, Connecticut on October 27, 1974. Mrs. Charak graduated from Southern Connecticut State College and is employed by Midwestern Indemnity, Cincinnati. Her husband is employed by Procter & Gamble.

Married: **James K. Ellsworth** to Miss Valerie L. Molnar on September 21, 1974 in Warrenville, Connecticut. The groom is a testing engineer at Pratt & Whitney, East Hartford, Conn. . . . **William H. Murwin, Jr.** and Miss Eileen D. Hubbard on October 12, 1974 in Oneonta, New York. The bride graduated from Barrington College and did graduate work at the State University College of Oneonta and the Presbyterian School of Christian Education, Richmond, Va. The bridegroom is a computer programmer with State Mutual Life Assurance Co., Worcester. . . . **John F. Noreika** to Miss Carole Lynn Sampson in Worcester on October 5, 1974. The bride is employed at Morgan Construction Co. Her husband is a civil engineer at Alden Research Laboratories, Holden. . . . **Stanley J. Piekos** to Miss Mary Lou Geran on September 14, 1974 in Worcester. The bride graduated from Becker and is a social service assistant in Randolph. The groom works for Foster Wheeler Energy Corp., Livingston, N.J.

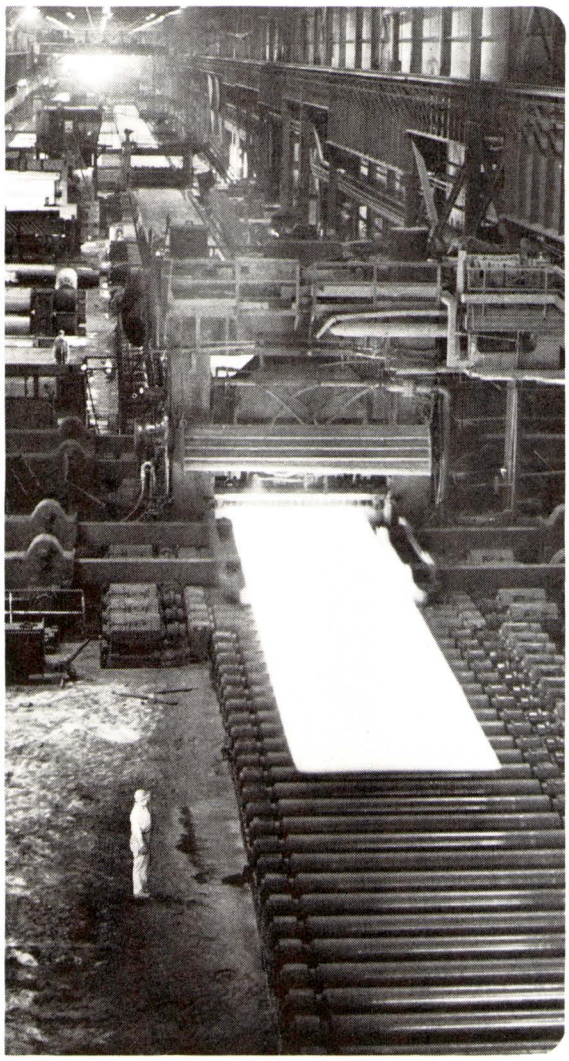
Married: **Robert Trotter** and Miss Robin Golden on October 26, 1974. Mrs. Trotter graduated from Becker. The bridegroom is employed by American Bosch/AMBAC as a project engineer and is also working towards his master's degree by taking evening courses at the University of Massachusetts. . . . **Lee D. Turner** and Miss Karen A. Gagnier in August in Jackson, Michigan. **Leonard Brzozowski** served as best man and **Garry Balboni, Lawrence Martiniano, Peter Thacher** and **John Young** as ushers. Mrs. Turner is a graduate of Eastern Michigan University. Her husband is a graduate student at Dartmouth. . . . **Charles M. Waldron** to Miss **Irene B. Jordan** in West Hartford, Connecticut on October 4, 1974. Mrs. Waldron is employed by Badger Co., in Cambridge. The bridegroom works as an actuary for Union Mutual Life Insurance of Portland, Maine. . . . **Robert R. Wood, Jr.** and Miss Kathryn L. Wicks recently in Reading, Massachusetts. The bride is a junior at the University of Massachusetts. Her husband is with Ingersoll-Rand in Wellesley.

Homoud A. Al-Rqobah is employed by the government of Kuwait in distillation plants which make fresh water out of sea water. . . . **Dennis A. Anctil** is a graduate student at Northeastern University, Boston. . . . **Jonathan R. Barnett, Robert E. Lindberg, Mark A. Wendell, Danielle M. Chouinard** and **Glenn E. Haringa** are doing graduate work at WPI. . . . **Gary R. Bellinger** has accepted a position with Uniroyal in Naugatuck, Conn. . . . **Neil E. Billings** works at Stone & Webster in Boston. . . . **James W. Bowen** is with the Torrington Co. in Connecticut. . . . **John H. Canatsoulis** attends graduate school at the University of Michigan. . . . **Louis F. Ciercielli** works for General Electric Co. in Fitchburg, Mass. . . . **Keith C. Coakley** is with Hamilton Standard, Windsor Locks, Conn.

Steven D. Dettman has joined Norden Aircraft, Norwalk, Conn. . . . **Robert C. DiGiovanni** is doing graduate work at WPI. . . . **Mathew A. DiPilato** is a staff engineer at Geotechnical Engineers, Inc., Winchester, Mass. . . . **Robert O. Dupuis** has been employed by Stone & Webster, Boston. . . . **James F. Edwards** is a graduate student at the University of Connecticut in Storrs. . . . **Robert W. Flanagan, Jr.** and **David O. Scott** are serving in the U.S. Army. . . . **William F. Frazier** and **Paul E. Nordstrom** attend graduate school at Northeastern University in Boston. . . . **Joseph H. Gaffen** works for United Engineers & Constructors, Inc., Boston. . . . Western Electric, New York City, has employed **Howard B. Greene.** . . . **William G. Gunther** has accepted employment at George Schmitt & Co. in Branford, Conn. . . . **Alan R. Hahnel** is employed by United Engineers and Constructors, Inc., in Boston. . . . **Dan Hartford** serves as a programmer at Syntex Corp., Palo Alto, Calif.

Lawrence R. Hayden is a graduate student at WPI. . . . **Ralph N. Isabella** is a methods engineer at Ingersoll-Rand in Athens, Pa. . . . **Richard J. Karpf** is a graduate student at Columbia University in New York City. . . . **Chester A. Kokoszka** has been employed by Northeast Utilities, Wethersfield, Conn. . . . **James A. Kudzal** has enrolled in graduate school at the University of New Hampshire. . . . **Bruce Lackey** holds the post of regional sales manager at GCA/McPherson Instrument Corp. in Acton, Mass. . . . **Ronald M. Lafreniere** works for the town of Marlboro, Mass. . . . **Gretchen Lapidus Lobo** is doing graduate work at M.I.T. . . . **George M. Leanna, Jr.** holds the position of engineering manager at M. G. Poulin Construction Co., Inc., Sterling, Mass. . . . **Edward J. Ledden** is studying at Tufts University School of Dentistry in Boston.

supertankers, sure!



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Dr. **George K. Lewis** serves as a research engineer in cardiology at Searle Co., Des Plaines, Illinois. . . . **Jeffrey C. Lindberg** is a graduate student at the University of Virginia in Charlottesville. . . . **Bruce R. Lyon** works at Texas Instrument Co. in Dallas, Texas. . . . 2/Lt. **James J. Martin,** a student pilot in the U.S. Air Force, is located in Valdosta, Ga. . . . **Wayne A. Massie** has been employed by Westinghouse Electric Corp. . . . **William E. McBride** recently joined Municipal Light & Power in Anchorage, Alaska. . . . **Gerald P. McCullough** is a factory and field engineer at General Electric in Fitchburg, Mass. . . . **Steven L. McGrath** is employed at the University of Pennsylvania Computer Center in Philadelphia. . . . **Richard E. Mellor** works for G.E. in Schenectady, N.Y. . . . **Angelo J. Mitsis** is with New England Electric, Westboro, Mass. . . . **Mark E. Munson** serves as a research assistant at Maine Medical Center in Portland.

Harvey B. Neilson has joined Raytheon Co., Sudbury, Mass. . . . **Gary E. Nunes** is with Stone and Webster in Boston. . . . **Janice E. Painter** teaches biology in Wilton, Conn. . . . **John Palitsch** currently works for Wyman Gordon. . . . **Thomas M. Palumbo** attends graduate school at Syracuse (N.Y.) University. . . . **Harry Paskali** is associated with Uniroyal, Inc., Naugatuck, Conn. . . . **Lawrence D. Patty** works at Newport News (Va.) Shipbuilding. . . . **Richard M. Peterson** is a graduate student at Princeton University. . . . **Peter J. Petroski** attends graduate school at Purdue University, Lafayette, Ind. . . . **Robert Plonsky** recently joined Monsanto Co. . . . **Neil Poulin** is with IBM. . . . **George F. Ranney** serves as a process engineer for E.I. duPont de Nemours & Co., Belle, W. Va.

Stephen J. Remen is associated with United Illuminating in New Haven, Conn. . . . **Elizabeth Ronchetti** works for Western Electric Co. . . . **James F. Rubino** is with Torrington (Conn.) Co. . . . **Carl D. Rydman** has joined Chas. T. Main, Boston. . . . Dr. **Alice Ann Sayler** serves as a postdoctoral research associate in the chemistry department at Cornell University in Ithaca, N.Y. . . . **Stephen R. Skutel** has been employed by State Mutual Life Assurance Co., Worcester. . . . **Robert D. Slack** is a development engineer at Fiber Industries, Inc., Salisbury, N.C. . . . **Matteo Solitro** is an employee at Monsanto Co. in Indian Orchard, Mass. . . . **William J. Stafford** serves as an engineer in training at Foundation Consulting Engineers, Inc., Columbia, S.C. He is also a graduate teaching assistant at the University of South Carolina. . . . **Richard M. Takanen** has been employed by General Electric Co., Cincinnati, Ohio. . . . **William P. Tanguay** is with Hammond Organ Co., Chicago, Ill. He is going to graduate school evenings at Illinois Institute of Technology. . . . **David M. Teixeira** does graduate work at Stanford (Calif.) University. . . . **Jay K. Thayer** is now employed at Yankee Atomic Electric Co., Westboro, Mass. . . . **Stephen N. Thibodeau** attends graduate school at the University of Washington in Seattle. . . . **Stephen J. Yankum** does graduate work at Northeastern University. . . . **Glenn S. Yee** is a sales engineering trainee for General Electric in New York City.

George K. Howe, '01, passed away on October 27, 1974 in Savannah, Georgia.

He was born on July 5, 1877, in Worcester and graduated with a BSME from WPI in 1901. During his lifetime he was an instructor at Oklahoma A & M College; a professor of mathematics at Atlanta University, where he also served as acting dean; and treasurer and business manager at Tougaloo College. Later he was associated with Bell Aircraft Corp. and Lockheed Aircraft in Marietta, Ga., from which he retired in 1954.

Mr. Howe belonged to the Mathematical Association of America. He was the cousin of Edward A. Hanff, '10.

Harrison G. Brown, '12, secretary-treasurer of the Tech Old-Timers Club,7 passed away on November 12, 1974, in Worcester. He was 84 years old.

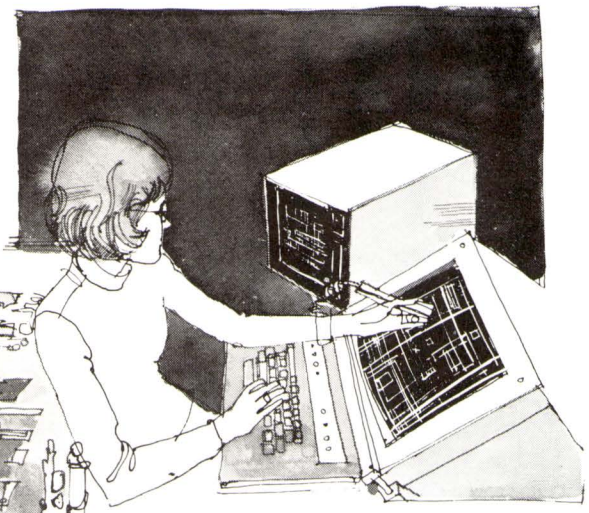
Born on December 30, 1889 in Lowell, Mass., he later graduated with a BS in electrical engineering from WPI. Following graduation he joined the Western Electric Co. as an installer. During his career he was associated with General Electric Co., Worcester Electric Light Co., Reed & Prince Mfg. Co. and Norton Co., Worcester. From 1923 until he retired in 1956, he was a standards engineer for Crompton & Knowles Corp. in Worcester.

Mr. Brown was secretary-treasurer of the Hadwen Park Improvement Association and a past commander of the Sons of Union Veterans. A member of the Wesley United Methodist Church for 65 years, he also belonged to the Masons. He was the father of Harrison K. Brown, '39.

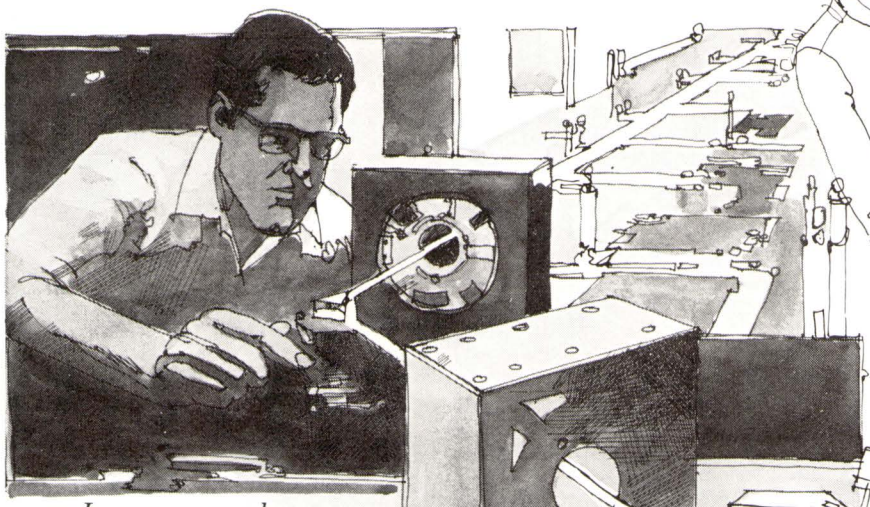
Albert L. Humphrey, '12, died on June 17, 1974, in Middleboro, Massachusetts.

He was born on May 5, 1889 in Rochester, Mass. After graduating as an electrical engineer from WPI, he worked as an inspector for the Factory Insurance Association in Hartford, Conn., later holding the same position with Phoenix Insurance Co. of Hartford. For over 35 years he operated his own insurance and poultry-raising business in Rochester.

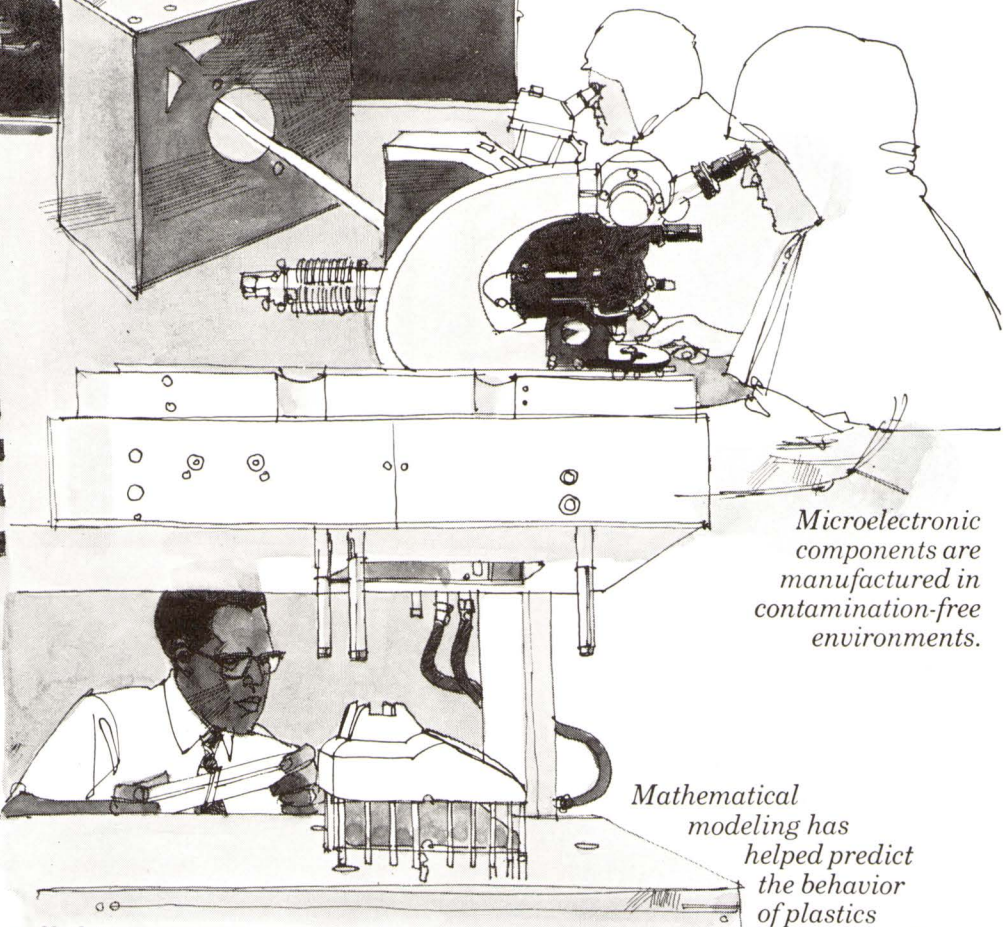
At Western Electric, we put science to work.



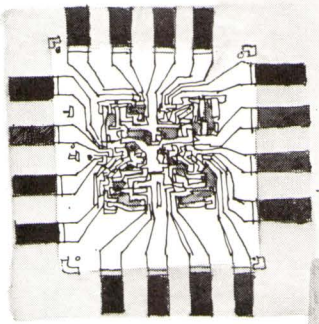
The installation diagrams for telephone switching centers have been generated through computer graphics.



Lasers are used in a variety of ways—from measuring to drilling and welding.



Microelectronic components are manufactured in contamination-free environments.



Like transistors before them, integrated circuits are spreading into every nook and cranny of the Bell System.

Mathematical modeling has helped predict the behavior of plastics in injection molding.

Managing all this is a new breed of talented people. Whatever their specialties, they also have to be comfortable working in other fundamental disciplines once left only to "pure scientists". At Western Electric, we put science to work.

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We make things that bring people closer.

Ernest A. Peel, '20, a retired president of the former Plantations Bank of Rhode Island, died on November 13, 1974, in Warwick at the age of 76.

He served as president of the Plantations Bank from 1961 until his retirement in 1963. His financial career included work in the investment field. He joined an investment firm shortly before the 1929 stock market crash and stayed in the business through the depression.

He was born in Fall River, Mass. on January 12, 1898, later studying at WPI. He was first associated with the Rhode Island Hospital Trust Co. as a clerk, then became office manager at MacColl, Fraser & Wheeler in Providence. In 1941 he was named comptroller of the Morris Plan Company of Rhode Island, a firm which at the time dominated the consumer credit business. Three years later the company converted to the Morris Plan Bank of Rhode Island with Mr. Peel as vice president-treasurer. In 1947 the bank changed its name to Plantations and he was named, vice president, then director and president.

Mr. Peel, a member of ATO, was past president of the Consumers Bank Association of New England and the Providence Clearing House. Also he had been a vice president of the Rhode Island Bankers Association and a trustee for the Big Brothers of Rhode Island.

Charles C. Hutchins, '21, died on September 16, 1974, in Ridgway, Pennsylvania at the age of 74.

He was born in Boston on January 11, 1900. After receiving his BSEE from WPI, he was associated with Westinghouse Electric and Manufacturing Company in Pittsburgh, Pa., where he was a designer of generators and motors. During his career he was employed as principal designer at Elliott Company in Pittsburgh. Later he was general manager of the Ridgway Division of Elliott.

During 1945 he was on a special mission with the Joint Intelligence Objectives Agency in Germany, Switzerland and France. Later he was a consulting engineer for various companies.

Mr. Hutchins served with International Executive Service Corps, Trafo Equipmentos, Ltd. of Porto Alegre, Brazil in 1967 and in 1970, 1971 and 1972 in Tunis, Tunisia with S.A.C.E.M. He was a past president of the Rotary Club in Ridgway.

Kenneth G. Knapp, '28, died at his home in Bradenton, Florida on September 8, 1974.

He was born on January 7, 1906, in Worcester and graduated from WPI as an electrical engineer in 1928. He had been employed at Westinghouse Electric, Chicopee Falls, Mass.; Bell Telephone Laboratories, New York City; and Western Electric Co., Allentown, Pa., where he was a planning engineer.

Alton B. Wyman, '33, died in Chillicothe, Ohio on September 9, 1974, at the age of 62.

He was born in East Burke, Vt., on May 2, 1912 and graduated as a civil engineer from WPI in 1933. During his career he was associated with D. E. Gardner Co., S. Monroe & Son, and C. A. Yeager, contracting firms in Portsmouth, Ohio.

From 1938 until 1941 he served as a planning engineer for the city of Portsmouth, later becoming an architectural engineer in Ft. Knox, Ky. He was a World War II veteran and a past secretary-treasurer of the J. H. Butt Company, Inc., in Chillicothe.

Mr. Wyman, a registered professional engineer and surveyor in Ohio, belonged to Phi Sigma Kappa, Tau Beta Pi, ASCE, NSPE and Sigma Xi.

Robert N. Pim, '44, of Media, Pennsylvania, passed away on April 23, 1974.

A native of Philadelphia, he was born on May 29, 1921. For a number of years he was associated with Sun Oil Co. in Philadelphia. He was a member of Phi Gamma Delta fraternity.

Arthur H. Zefting, '44, of Rochester, New York died on September 17, 1974, following a three-month illness. He was 53.

He was born in Hartford, Conn., attended Hillyer Junior College and was graduated from WPI as an electrical engineer. He served with the U.S. Navy and for five years was employed by the National Bureau of Standards. During most of his career he was in engineering management with General Dynamics/Electronics.

Mr. Zefting belonged to IRE and the National Security Industrial Association. He was a past vice president of the Rochester-Genesee chapter of the Alumni Association.

G. Wayne Gibbs, Jr., '70 SIM, died on October 28, 1974 in Worcester. He was 48 years old.

He was sales manager for David Clark Co., Inc., Worcester, since 1958. A native of Fitchburg, Mass., he was born on October 12, 1926. He belonged to the Air Force Association of Worcester and served as treasurer of Boy Scout Troop 178 in Holden.

What's happening at WPI?

Athletics

(*designates home games)

Basketball

March 1 Clark, 8 pm*
10 (women's) Assumption, 6 pm

Swimming

March 7-9 New Englands at Brown

Skiing

March 1-2 Suicide Six at Babson

Track

February 28-
March 1 (indoor) New Englands at Tufts and Northeastern
April 8 Coast Guard, 3 pm*
12 Bentley, Lowell, Nichols, 2 pm*
16 Worcester State, Clark, Assumption, 3:30 pm*
19 Colby, Norwich, 2 pm*
26 M.I.T., 12:30 pm
30 Tufts, 3:30 pm*

Golf

April 4 Coast Guard, 1 pm*
10 Trinity, 1 pm*
15 Bentley, Providence, 1 pm
17 Babson, M.I.T., 12:30 pm*
21 Holy Cross, Assumption, 1 pm*
23 Amherst, UMass, 1 pm
25 Clark, Tufts, 1 pm
29 Lowell Tech, 1 pm

Tennis

April 8 Clark, 2 pm*
10 Assumption, 2 pm
12 Bentley, 3 pm
16 Holy Cross, 1:30 pm*
19 Babson, 2 pm*
21 Coast Guard, 2 pm*

Baseball

April 11 Wesleyan, 3 pm*
12 Clark, 2 pm
16 Brandeis, 3 pm
18 Trinity, 3 pm*
19 Hartford, 1 pm*
22 A.I.C., 3 pm
26 Lowell Tech, 1 pm
29 Tufts, 3:30 pm*

Films

(all in Alden Memorial Auditorium)

March 4 **"Shoot the Piano Player,"** 7:30 pm
March 11 **"Socrates,"** 7:30 pm
April 8 **"A King in New York,"** with Charles Chaplin, 7:30 pm
April 15 **"Conrack,"** 7:30 pm

Concerts

March 3 **Alexander's Feast,** medieval and renaissance music, Alden, 8 pm
March 6 **Steve Dacri's magic,** Riley Hall Coffeehouse, 8 pm
March 8 **Glee Club** with Smith College, Alden, 8 pm
April 12 **Glee Club** with Skidmore College, Alden, 8:15 pm
April 14 **Hersh and Montgomery,** ragtime and salon music in the Grand Tradition, Alden, 8 pm

WPI Colloquium

March 5 **"The National Wind Generator Program,"** Ronald L. Thomas, head of the federal Wind Energy Office, Olin 107, 4:30 pm
April 2 **"The Role of Technology,"** Dr. Edward Teller of the University of California, Olin 107, 4:30 pm
May 7 **"The Hydrogen Fuel Economy,"** Dr. Lawrence W. Jones of the University of Michigan, Olin 107, 4:30 pm

Other notable occasions

February 28-
March 1 Winter Weekend
March 20-
April 2 No classes, between terms
April 18-19 Spring Weekend